RETURN TO THE WORLD OF

BLADE RUNNER

In 1982, Ridley Scott introduced a bold and breathtaking new vision of the future in the seminal science-fiction classic *Blade Runner*. 35 years later, join us on a journey back into the world of *Blade Runner* with this official visual chronicle of the highly anticipated film.

Directed by Denis Villeneuve (*Arrival*, *Sicario*, *Prisoners*), with cinematography by Roger Deakins (*Skyfall*, *The Shawshank Redemption*) and a screenplay by Michael Green (*Logan*, *American Gods*) and Hampton Fancher (*Blade Runner*), BLADE RUNNER 2049 follows Officer K (Ryan Gosling), a new LAPD blade runner who unearths a long-buried secret with the potential to plunge what's left of society into chaos. His discovery leads him on a quest to find Rick Deckard (Harrison Ford), a former blade runner who's been missing for 30 years.

Chronicling the entire production for two years straight, author Tanya Lapointe provides unprecedented access to the director's creative process, giving readers an insider's look into the making of this groundbreaking epic. Enjoy 220 pages of exclusive concept art, storyboards, behind-the-scenes photography, and production stills, accompanied by fascinating insights from the cast and crew. With an introduction by Denis Villeneuve, *The Art and Soul of Blade Runner 2049* is the definitive guide to the unforgettable characters, iconic environments, and unbelievable technology featured in the film, revealing in amazing detail how Villeneuve and his team realized this inspired new contribution to the *Blade Runner* legacy, sure to captivate sci-fi fans for decades to come.

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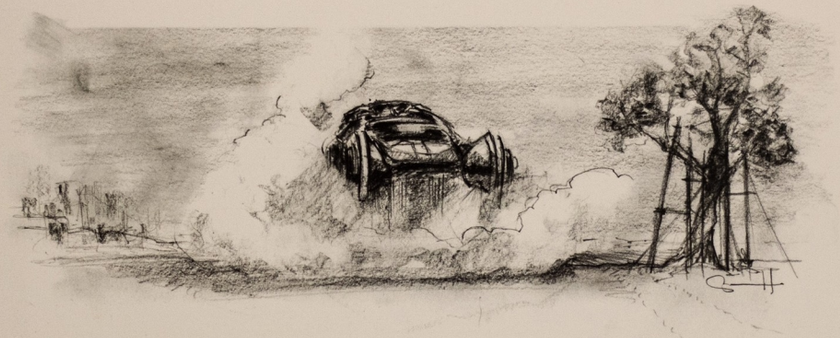
THE ART AND SOUL OF

BLADE RUNNER 2049

FOREWORD BY
DENIS VILLENEUVE

WRITTEN BY
TANYA LAPOINTE



>>> "IN THE WORLD OF *BLADE RUNNER*, we have humans and we have Replicants. Although they look very much the same, they're considered very, very different because one is born and one is manufactured. The qualitative difference between the two is that someone born is thought to have a soul, while someone manufactured may perhaps not. This film explores what it means to live in a world feeling like you don't have a soul and starting to want one, and in the process of wanting a soul, acting like someone who has a soul in the first place."

—**MICHAEL GREEN,** SCREENWRITER, *BLADE RUNNER 2049*

>>> "WHEN WE REALLY KNOW WHAT IT'S LIKE to feel like somebody else, we won't want to do the bad things we do to everybody else. And that's huge. I think our salvation is in there."

—**HAMPTON FANCHER,** SCREENWRITER,
BLADE RUNNER AND *BLADE RUNNER 2049*

THE ART AND SOUL OF BLADE RUNNER 2049

WRITTEN BY
Tanya Lapointe

FOREWORD BY
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FOREWORD BY DIRECTOR DENIS VILLENEUVE

>>> "I PUT TOGETHER A TEAM OF
# DREAMERS
TO CREATE THE FUTURE OF
AN OLD DREAM."

—DENIS VILLENEUVE, DIRECTOR OF *BLADE RUNNER 2049*

Once I made peace with the idea that making a sequel to one of the most influential science-fiction movies ever made was insane arrogance, I immediately came across a problem.

Ridley Scott's original *Blade Runner* was set in 2019. A punk dystopian vision of the future, inspired by the pop culture of the end of the '70s. One of the biggest challenges of *Blade Runner 2049* would be imagining how this iconic world would evolve, becoming an alternate universe in itself. Steve Jobs didn't exist in the original *Blade Runner*, and the USSR still ruled half of the world. For a time, I felt trapped in the logic of it all. What should be included in this universe and what shouldn't?

I went to New York to have coffee with Hampton Fancher, the writer of the original movie. In the lobby of an Art Deco hotel, he gave me the key to making this film. He told me, "Listen, stop putting pressure on your shoulders. The first movie was a dream. We just dreamed a lot. You have to do the same thing. Don't try to overthink the logic."

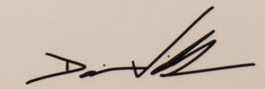
So I put together a team of dreamers, to create the future of an old dream. I asked them to imagine the future without Steve Jobs, but with the USSR, and to create a *Blade Runner* world with the silver light of Canadian winters.

In the summer of 2015, a reconnaissance squad of concept artists was airborne above the *Blade Runner* world, and started a visual exploration led by designer Aaron Haye. They were the first dreamers, and some of their work is still alive in the movie today.

I spent several weeks in the fall of that year in a hotel room in Montreal with cinematographer Roger Deakins and storyboard artists Sam Hudecki and Darryl Henley, drawing the foundation of what would become our movie. Production designer Dennis Gassner joined the team at the end of 2015, and we were ready to start. Together, we chose Budapest as our playground, hired one of the best teams ever assembled, and made the dream a reality.

One of the most beautiful things about cinema, for me, is that it's a collective act of poetry. A small army of artists working in the dark, creating illusions and emotions in order to explore shadows and beauty of the human condition. Reporter Tanya Lapointe followed the entire creative process. As my life partner and assistant on this movie, she had a front row seat to this movie-making experience. We are happy to share it with you in this book.

So with that, it's my pleasure to welcome you to 2049!



July 1, 2017

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THE LONG ROAD BACK TO BLADE RUNNER

"I've seen things you people wouldn't believe." Those final words spoken by Roy Batty in the original *Blade Runner* apply to all of us who have had the privilege of working on *Blade Runner 2049*. Having been a journalist for 15 years, I took in every detail of the two-year journey. I now have the honor of sharing a first-hand account of this epic movie-making experience. This book will take you behind the scenes, visiting each set and offering exclusive access and insights from the cast and crew. In this chapter, we begin with the origins of this audacious project, leading us then into K's journey as it unfolds on screen. This book is about more than celebrating the art of *Blade Runner 2049*. It's about capturing its soul, so that all these moments will not be lost in time.

THE RIGHTS

Let's not linger on the infamous story of the original *Blade Runner*. Yes, it was a challenge to make. It was also avant-garde, influential, and groundbreaking. It is now considered a classic, an iconic masterpiece. But no, Ridley Scott and Harrison Ford still don't agree on whether or not Deckard is a Replicant. The truth is, the legacy of the first movie is a tough one to follow up. That's why this book exists–to chronicle the efforts of those who made that giant leap to make a sequel with dedication, hard work, and most of all, heartfelt respect for Ridley Scott's work.

The story of *Blade Runner 2049* spans over a decade, from the birth of the idea to its release in October 2017. "It was on the shelf for a long time," says producer Cynthia Yorkin. Her husband Bud Yorkin was a financier on the original *Blade Runner* with Jerry Perenchio. After the film's release in 1982, neither partner wanted to pursue a sequel. "There was no interest," she recalls. "Then almost 10 years ago, Bud and I finally tossed around the idea of doing a sequel or a prequel, because it had become so beloved."

Ridley Scott, director of the seminal film, always knew that he had something special, though even he admits that its rising fandom was a pleasant surprise. "It grew by accident," Scott explains. "Somebody gave a Santa Barbara film festival some cut of the movie they found in a drawer, and it created a furor. People said, 'Wow, there's no voiceover on this. There's no silly ending where we fly off into the wilderness. And my God, the film ends like a film noir, in the elevator with Harrison Ford and Sean Young going off together.'" With time, the VHS release of the Director's Cut in 1992 and the Final Cut in 2007 won critical acclaim and continued to foster a growing fan-base around the world. "It felt like the right time to pursue it," says Yorkin. "So Bud and I decided to work on it together. It was a dream of his to get this done."

It took seven years to negotiate and untangle the legal rights. At one point, there was talk of a television series, an idea quickly discarded. "We weighed different options and went with Andrew Kosove and Broderick Johnson at Alcon," says Cynthia Yorkin. "They involved us in every aspect. We were partners, and they kept their word." Their first meeting coincided with a fortunate stretch for Alcon Entertainment. "We had a number of successful films, culminating with *The Blind Side*, which was the most successful sports movie ever made," says Andrew Kosove, producer and co-CEO of Alcon Entertainment. "So we were sitting on a big balance sheet with a lot of money, and our lawyer told us Bud and Cynthia Yorkin had the rights to *Blade Runner*." He and producer and co-CEO Broderick Johnson pursued the idea. "When we made the deal," says Kosove, "I thought to myself, 'The bar is high, but whatever, roll the dice.'"

The stakes were high, but Alcon was going all in. This was 2011, and Ridley Scott was shooting *Prometheus*. Andrew Kosove left word for him, asking if he was interested in a *Blade Runner* sequel. "15 minutes later, Ridley was asking us to meet him in London," explains Kosove. "He told us that *Blade Runner* was never meant to be a one-off movie. It was stand-alone from a story standpoint, but he had other ideas to do sequels and prequels."

The idea of a sequel was a long time coming for Ridley Scott. "I always had the story in mind," Scott says. "After we finished the first *Blade Runner*, Ridley called now and again for a few years in the eighties, asking me to talk about possibilities," recalls Hampton Fancher, the screenwriter of the original *Blade Runner*. "But the rights were never available."

THE SCRIPT

After the rights were acquired by Alcon, everything moved along smoothly, explains producer and Alcon co-CEO Broderick Johnson. "We overcame many hurdles, but looking back, there was never really a lull in the momentum of the project." The script development process was also "pretty easy" according to Ridley Scott, if only because Alcon wisely decided to find strength in another original team member of the first film.

In 2011, Hampton Fancher got an unexpected call from Ridley Scott. "Ridley asks me, 'Do you have any ideas for a sequel?' And I said, 'Strangely enough, I do,'" recounts Fancher. "It was serendipity, because, that very hour, I had finished a new short story. So I said, 'Listen to this,' and I read the first paragraph. He said, 'Can you come to London?' And that's how we started."

Though Tyrell dies in the first film, his arrogance, ambition, and legacy were the root of the new plotline. "He was a trillionaire whose fun was to create Replicants," explains Scott. "We don't know for sure that Harrison Ford was a Nexus. Harrison refused to believe it, and I said, 'Harry, you're a Nexus.' So did Tyrell make him as a Nexus 6 or a Nexus 7? Deckard is his most sophisticated Replicant, and he's kind of falling for this beautiful Replicant in the film. And that's the birth of our narrative."

Much like the original, the new film was to remain an intimate, character-driven story with scope. It would not reveal the Off-Worlds, nor the mythology behind how Replicants are designed and built. It was not about exploring the world, but telling a personal story with something meaningful to say. One of the key themes addressed in this film is the value of life. In the first, it was about quantity of life, or as Roy Batty put it, "I want more life, fucker!" This existential question is pushed even further in the sequel. "Now that Replicants have more life, they want a better life," says Johnson.

Within a year, Ridley and Hampton had developed the core plotline. "Hampton wrote an 85-page story with his beautiful style of dialogue," recalls Scott. In 2013, Michael Green was then hired to take Fancher's extensive treatment and turn it into a screenplay. "The original film has a very spartan, beautifully told investigation story. Audiences now are capable of taking in so much more information. So we were able to tell a story that had a few more twists and turns," explains Green. The screenwriter also spent crucial time with Ridley Scott to discuss the themes and nuances of the script. "No one's perspective is as fascinating and singular as the way Ridley sees his own film. To hear him tell me what he thought *Blade Runner* was about changed my view of the whole film forever."

"*Blade Runner* is not something you come into lightly," quips Green on taking on the challenge. "The resonance of the original *Blade Runner* comes from so many different things. It's a combination of the brilliance of the people who were making it at the time, and the sheer accident of their brilliance coming together to make something even larger than even they expected. So I didn't get to just jump in and say, 'I'm gonna write the sequel to *Blade Runner*.' Everyone involved with this movie loved the original film, and they all wanted to make sure that whoever got the chance to make this movie was the right person for the job."

THE DIRECTOR

Originally, the plan was for Ridley Scott to direct the movie, but when Michael Green completed the script and momentum began to build, Ridley's schedule became an issue. "Ridley goes from one movie to the next," Johnson explains. "If you aren't there at the right moment, you miss your turn, and wait."

As it turns out, when Harrison Ford signed on to play Deckard in 2014, Ridley Scott's plate was full. "He was preparing to shoot two more installments of *Prometheus*, the first of which is now *Alien: Covenant*," recalls Johnson. "Andrew Kosove, Harrison Ford, and I told him we couldn't wait. Harrison's perspective was, 'I'm not getting any younger and I'm not waiting around.'" With that, Ridley Scott became executive producer and another director would have to replace him. "That would prove to be the most important decision Alcon would have to make," says Johnson.

It was Alcon that recommended director Denis Villeneuve, with whom they had previously worked on *Prisoners*. "I remember on a cold night of principal photography of that movie, Denis told me *Blade Runner* was his favorite movie of all time," recalls Kosove. That casual conversation would years later change the fate of this film. "I would have never dared propose myself for such a task," assures Villeneuve. "It came out of the blue. Andrew Kosove put an envelope on the table with 'Queensboro' written on it. And he said, 'Queensboro doesn't exist. This is the screenplay of the next *Blade Runner*.' I was moved. However, I had one condition. I needed to sit in front of Ridley Scott, look him in the eye, and get his blessing."

"When Alcon came up with Denis to direct, I thought it was a great idea," asserts Ridley Scott. Aside from its overall cadence and style, there wasn't anything specific that Scott wanted to carry over from the original film into the sequel. He wanted to give Villeneuve total freedom when he came on board as director. "He's very respectful of the process, which is nice, but I said don't respect it too much," recalls Scott. "You've gotta do your own thing."

The first thing Villeneuve did was reach out to cinematographer and long-term collaborator Roger Deakins, with whom he had made *Prisoners* and *Sicario*. Villeneuve asked Deakins if he would do *Blade Runner* with him. "It was kind of a no-brainer," chuckles Deakins. "On the one hand, you're going to be condemned for doing a sequel, and it's never going to live up to the original. You can't win, really. But it was just too good a challenge to miss."

Next person up was storyboard artist Sam Hudecki, who had worked on four movies with Villeneuve before *Blade Runner 2049*. Hudecki has a knack for channeling Villeneuve's visions and putting them on paper. When words aren't enough to express an idea, a short storyboarding session with Hudecki is often the fastest and most efficient way for the director to design a concept, brainstorm a story element, or even communicate a tone. "Some people say that Denis uses three languages: French, English, and Sam," says Hudecki with a laugh.

The creative process started in Montreal in the fall of 2015. Villeneuve was still editing *Arrival*, so the core team on *Blade Runner 2049* came to him. Stationed in Montreal for several weeks, the team–executive producer Bill Carraro, cinematographer Roger Deakins and his wife James, production designer Dennis Gassner, and storyboard artists Sam Hudecki and Darryl Henley–started pulling images from the screenplay and bringing them to life.

THE CAST AND CREW

It was crucial that Harrison Ford reprise the role of Deckard, as he was central to the plot of the new movie. Ridley Scott was the first to tell him about their plans. "I said 'Look, there's something cooking. Second Blade.' He said, 'Oh yeah? Am I in it?' I think he was a little skeptical. But I sent him the script and he said, 'Ridley, this is wonderful. Correction, this is the best script I've ever read.'" Simple as that, Harrison Ford was on board. "First of all, we had a story that is worthy of our efforts," says the iconic actor. "Number two, I'm still alive, which I think is a good thing."

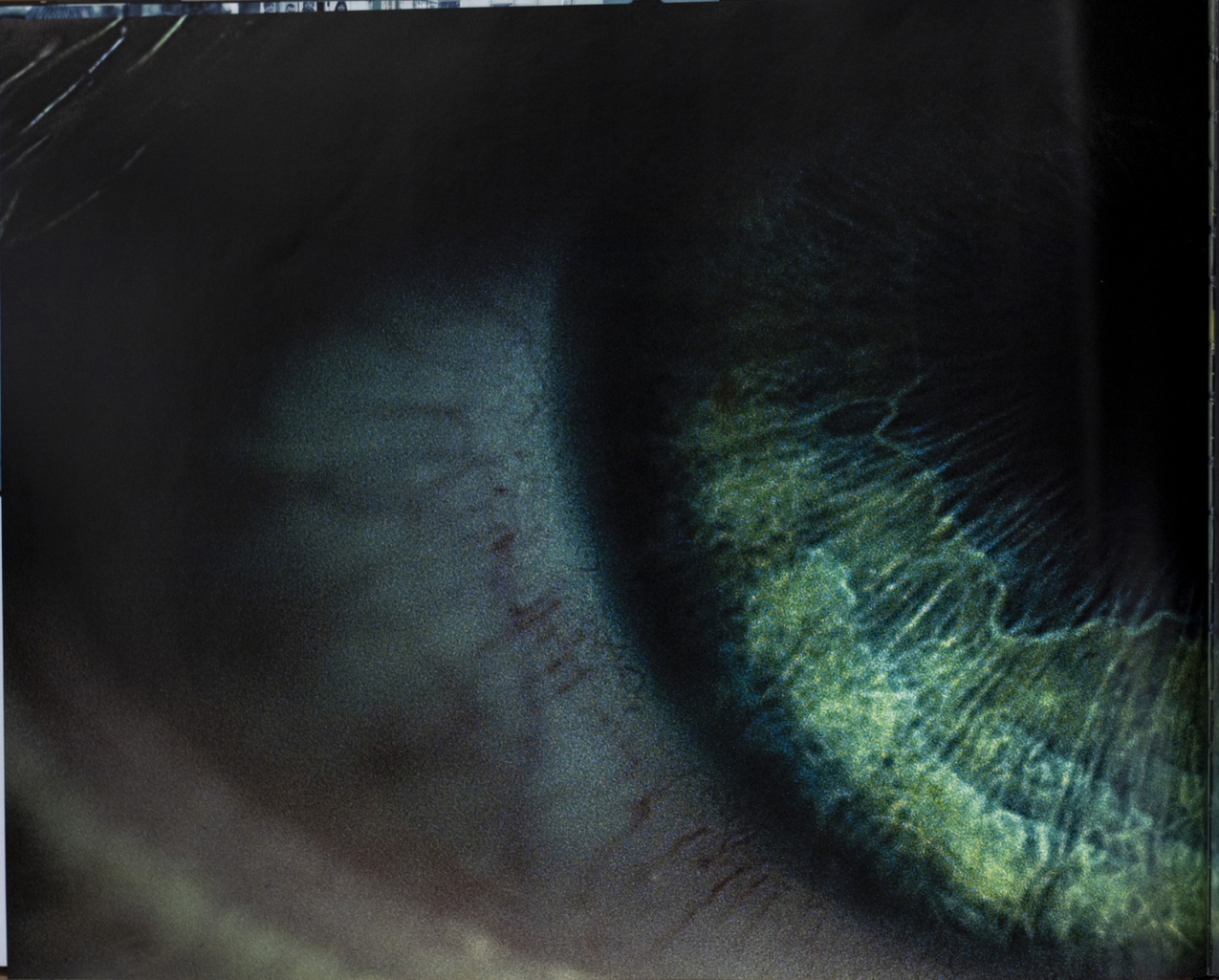
Though key to the plot, the sequel is not told from Deckard's point of view. The audience follows a new Blade Runner named K. The actor chosen to play him came up early in the process, recalls Hampton Fancher. "Ridley asks me, 'Who do you see in the role of K?' I said, 'Ryan Gosling.' And he says, 'You got it.' I'm thinking, 'Yeah, sure, right.' But almost four years later, here comes Ryan Gosling." When Denis Villeneuve read the script, he agreed that there was no one better suited for the role. The director and actor hit it off right away. "The first conversation I had with Denis, he told me, 'In my *Blade Runner*, it snows,'" recounts Gosling. "He's Canadian, so he had to ground this world in an environment he knew. Right then, I understood him. Everything was about grounding the film, making it possible, making it feel truthful."

With his leads locked, Villeneuve enlisted his dream cast and crew, including production designer Dennis Gassner who had met Ridley Scott almost 40 years ago. "He showed up at Zoetrope in 1980 looking for neon when I was Dean Tavoularis' assistant, Francis Coppola's designer. I opened the warehouse doors to 2.5 miles of neon we had from *One From The Heart*. He asked, 'How much can I have?' I said, 'All of it.' Then I asked, 'What film are you making?' And he said, 'This little film called *Blade Runner*.'" Decades later, Gassner was diving into that same neon-lit world.

On July 11th, 2016, principal photography began in Budapest with a diverse crew hailing from a dozen countries. "It was amazing coming to work and saying 'good morning' in 8 or 9 different languages," says first assistant director Don Sparks. "Hungary was the best place to do it, because that's where the Rubik's Cube was invented," joked executive producer Bill Carraro. "We had to juggle a schedule between 10 different stages, several back-lot builds, and a million-gallon water tank." It was no small task. "I must admit, we added a few days, but we're actually on budget," adds Carraro. "It's incredible how efficiently this movie was made," Kosove praises. "It's what happens when you have top-notch people who know what they want."

The majority of the still photographs in this book come from unit photographer Stephen Vaughan, who came out of retirement to capture the set of *Blade Runner 2049*, just as he had on the original movie. There were several other epic reunions on set. Sean Young, who once played Rachael, visited the set, and Edward James Olmos even reprised his role as Gaff for a scene with Ryan Gosling. "It was wonderful having people from the first film on this one," says producer Cynthia Yorkin. "We've got Ridley Scott, Hampton Fancher, Syd Mead, and of course Harrison Ford." Unfortunately, Bud Yorkin was only there in spirit, having passed away in August 2015. "It was a wonderful gift for him to know that this film was going to be done right."

"I think *Blade Runner 2049* is a poetic existential journey," says Kosove. "It's about someone trying to figure out what their meaning as an entity is, which in a lot of ways is the journey everyone goes on, whether you're a human being or a Replicant."



BRUTALITY AND CHAOS

THE WORLD BUILDING BLOCKS OF BLADE RUNNER 2049

Brutalism was almost an obsession for director Denis Villeneuve on *Blade Runner 2049*. The design, the architecture, the Spinners, the costumes; everything had to be dark and "beautifully brutal." He called it Post Neo-Brutalism. The term emerged when production designer Dennis Gassner first met the director and asked him, "What one word encompasses his vision of design for the film?" Villeneuve answered, you guessed it, "brutality." "We also threw in another word chaos," chuckles Gassner. "Brutality and chaos became the language pattern of the film." In other words, they became the through line for all research, concept art, and set design.

WORLD BUILDING

The *Blade Runner 2049* creative team shared a deep love for the first movie. They were united by an equal desire to honor Ridley Scott's work, as they audaciously embraced the gargantuan task of carrying his legacy into a new film. That mission came with tremendous pressure, but Denis Villeneuve received Ridley Scott's blessing to create his own vision of the world. "Ridley Scott told me exactly what I needed to hear," recalls Villeneuve. "He gave me total freedom and said he was available to answer all my questions."

In truth, Ridley Scott had been hoping for a new take on the world that he created in the eighties. "It has been used so many times since, it's driving me crazy." The new script that he drafted with Hampton Fancher and later Michael Green explored new ground and new possibilities. "We wanted to see how the world had changed in 30 years," explains Michael Green. "We wanted to go outside Los Angeles and make the story grow."

To begin, Villeneuve enlisted two long-time collaborators to join him in Montreal and start imagining how they would tell the story visually. "We basically talked about the script and then just started storyboarding," recalls cinematographer Roger Deakins. "Denis was working on his last film while we were up there. So I would sit with Sam Hudecki, the storyboard artist, and my wife James. And we would just sketch ideas. All day. And we worked like that for weeks." For the following eight months, these 2-4 hour drawing sessions became a daily routine, even on weekends. With each sketch, they defined their vision further and made this movie their own.

"It's like walking on a knife's edge," states Dennis Gassner early in pre-production. "We're riding the line between the original film and what we're doing over 30 years later." The principal objective of this endeavor was to make a movie in its own right, one that would push the limits of modern-day filmmaking. "Denis, Roger, and Dennis were actively trying not to tread too heavily in the footsteps of the first film," remembers supervising art director Paul Inglis. "And then, in a very natural way, the original film crept back into our DNA." One thing was clear, Villeneuve wanted to stay clear of anything that had previously been done in science fiction. A simple comment from the team like, "Oh yes, we did that on another movie" was not received as reassurance, but a warning that it was time to go back to the drawing board.

>>> "PEOPLE TAKE YEARS TO MAKE ONE BUILDING, AND I HAVE TO BUILD A WHOLE CITY."

—DENIS VILLENEUVE, DIRECTOR

VISUAL EXPLORATION

In the summer of 2015, a small think tank of concept designers started dreaming about this new expression of the *Blade Runner* universe. Concept artist Victor Martinez recalls being crammed in a tiny room with three other artists secretly working on the film. "A lot of research went into these visual explorations. We didn't have a script, so we had to figure out how to tell a story with images alone and getting people to react to them." Villeneuve loved these early designs, because they contributed to refining the style and directly inspiring certain elements in the film. "Even if some images didn't make it into the film, they fed the process," says Martinez. "If you look closely, you'll find some *Blade Runner* gold there."

ROW 1

Early concept art for Deckard and Dog exploring Las Vegas ruins
Concept art of K's Spinner soaring over the Trash Mesa
One of the first approved concept art pieces of Los Angeles 2049
Early concept art of the Wallace Towers
Early concept art of the Wallace Towers
Concept art for the Orphanage sorting room

ROW 2

Concept art for the iconic snow sweeper scene
Early environmental study of Los Angeles 2049
Conceptual mood piece for the Moebius rooftop scene
Environmental study of Los Angeles 2049
Conceptual art variation on the Wallace Nexus Reliquary
Environmental study of Los Angeles 2049

ROW 3

Early concept art featuring K exploring the Trash Mesa
Early environmental study of the Grapevine farmlands
Early exploration of the Memory Lab virtual world
Early environmental study of Las Vegas 2049
Concept art for the Orphanage sorting room
Conceptual mood piece for the Moebius rooftop scene

ROW 4

Concept art of the Orphanage exterior
Early concept art for Las Vegas 2049
Early concept art of the Wallace Towers
Early concept art of the Wallace Towers
Early concept art of an Off-World transport vessel
Early visualization of the Memory Lab

Innovation was a recurring theme throughout production. "Science fiction is hard to do, because everything has already been done," says Denis Villeneuve. Luckily, Hampton Fancher found a way of staying out of the other film's shadow with another bit of wisdom. "We are in *Blade Runner*'s future, in a parallel universe. If we create a distance with real life, it can tell us so much about our own reality." Michael Green pushed that concept further. "We committed to the idea that this was an alternate world. It's not our world gone tragic."

As this alternate future was created, it remained anchored in classic references such as the comic books of Moebius and Enki Bilal. "Denis wanted the movie to have a classic yet futuristic quality," recalls VFX supervisor John Nelson. "If it looks like you can buy it now, it's not going to make it into the film. If you fall into the 1940s or 2040s, you're okay. 2017, not so much."

Inspiration for the tonality and palette of the city also came from modern-day China. "I think a key image was one Denis found of Beijing in the smog," observes Roger Deakins. "That became the reference for the look of the film." From that point on, Double Negative and other VFX vendors started producing concept art that translated Villeneuve's vision of the future. "Denis felt like they had finally found the tone," explains Nelson about the images featured on this spread, which were two of the very first pieces approved by the director. "He liked the multiple scales of buildings. The presence of logos and faces. And the silver sky with warm projections."

There is darkness, brutalism, and yet a lot of light in these images, fitting the film's established aesthetic style. These early visualizations of Los Angeles also laid the foundation for future architectural explorations, recounts Dennis Gassner. "One key advantage that we have now is the ability to create scale."

>> "THE ENVIRONMENT IS MORE BRUTAL, BUT WE CAN STILL FIND BEAUTY IN THIS WORLD."

–DENIS VILLENEUVE, DIRECTOR

THE ENVIRONMENT

"Things have not gotten much better in terms of the ecology of planet Earth," says Harrison Ford about the climate in *Blade Runner 2049*. "It remains a grim yet very interesting portrait of a possible future." It's safe to say the state of the environment has drastically worsened over the past 30 years. The air and water have become toxic. No organic matter can even survive in this highly polluted world. Animals and plants have all gone extinct, and basic commodities are hard to come by. Everyday items once considered commonplace are now rare and worth a fortune. "Finding a wooden horse is like finding a Mickey Mantle baseball card," adds John Nelson.

Rising sea levels have caused severe damage in the world, triggering mass migration to urban centers. And as cataclysms multiplied on Earth, more humans moved to the Off-Worlds. "There are less people on Earth, but cities are denser because there is less space," explains Hampton Fancher. "Many places are off limits, because they're poisoned with pollution."

Those left on Earth never see sunlight, because the city is perpetually blanketed by thick layers of smog and clouds. "I found it deeply inspiring that the climate has completely changed between both movies," says Villeneuve. This allowed them to "build concentric circles" around the first movie, explains Michael Green. "Denis' eye specifically brought a unique Third World element to show how the world is crumbling." While more Replicants are being manufactured as a disposable workforce, new problems have arisen. "The world of *Blade Runner* indirectly evolved into a condition of apartheid," says Ridley Scott. "You create a new race of people who should be accepted, should be equal. Roy Batty proved to be more human than human, after all."

"THERE'S SOMETHING UPSETTINGLY PLAUSIBLE ABOUT THE FUTURE OF *BLADE RUNNER*. YOU LOOK AT THAT WORLD AND THINK, YEAH, WE COULD GET THERE."<<<

–MICHAEL GREEN, SCREENWRITER

BELOW: Over the past decades, the rising sea levels have destroyed the California coastline, forcing the city of Los Angeles to build the Sepulveda Sea Wall. Everything west of the enormous protective barrier has been engulfed by the Pacific Ocean.

SIZING UP SOCIETY

Where's the color? Denis Villeneuve intentionally didn't want any in this harsh world of survival. What he did want was a dark and bleak skyline with occasional pops of color and bright lights. "The architecture is more brutal, designed to resist extreme weather," says Villeneuve. "Most buildings look like bunkers, while others resemble spaceships."

"Landscape is almost a mystical thing," states Syd Mead, the famous visual futurist responsible for the revolutionary design of the first movie. "Architecture is the background to human activity. Always has been. So when you're doing a movie like *Blade Runner*, you have to treat architecture as part of the story." That was the underlying thought when designing the iconic film. "My concept for *Blade Runner* was that the street level was now the basement of the city," Mead remembers. "People who aren't doing too well only live there. The more fortunate never go below the 40th floor." Syd Mead's philosophy became the foundation for imagining the alternate version of Los Angeles in 2049.

"We honored and respected that legacy, because it's why we got to make this movie in the first place," says Dennis Gassner. "It's the infrastructure of this new film. We just built on top of that, from the ground floor up." Gassner's team designed thousands of buildings. Among the new additions to the skyline are three "mammoth scale" buildings belonging to the Wallace Corporation. In this alternate future, Niander Wallace, CEO of Wallace Corp, is the richest and most powerful man on Earth. The headquarters of his company are visual proof of that.

Once the vision of the world was set, the team aligned with Weta Workshop to build and film miniature versions of the city, which were finally entrusted to the VFX Department, who added scope and a richer sense of reality. "A city's development normally happens organically over hundreds of thousands of years, by hundreds of thousands of architects," says John Nelson. For this film, however, the creative team had less than a year. "People take years to design one building, and I have to build an entire city," says Villeneuve on the many decisions required to bring his vision to the screen.

THIS SPREAD: In this early concept art, the "mammoth scale" Wallace Towers overpower the entire cityscape. Later in post-production, the familiar Tyrell buildings were added to the landscape, which gave the relative perspective needed to add scale and scope to these menacing towers.

RIGHT: A before and after comparison of the city's urban design, as described by John Nelson: "We dropped the floor of the streets, and it added 10 floors of urban development and 10-20 years to the city. It's canyon-like, so when you go down into the city, it feels like an archaeological dig."

ACHIEVING REALISM

Although these types of environments normally require extensive visual effects, Denis Villeneuve and Roger Deakins insisted on respecting the *Blade Runner* tradition. "My dream was to film the world in a practical way," recalls the director. "There's a link with reality in every shot."

People worked around the clock. In Budapest, first unit filmed during the day, and when they wrapped, the crew at Weta Workshop took over down under. The New Zealand-based miniature studio was responsible for recreating the city's architecture in small-scale to add more realism. "Those miniatures were gigantic," praises Villeneuve. "It's very moving to see them building this world. And it's striking how, when you shoot real things, you can feel it." Alex Funke agrees. The director of photography working with Weta has been building miniatures for 50 years on iconic works ranging from the original *Battlestar Galactica* to Peter Jackson's *Lord of the Rings* trilogy. "There are inherent flaws when you're filming real surfaces with real light and a real lens. It can't be reproduced digitally, no matter how hard you try."

With the rapidly developing computer-generated technology, miniature building has somewhat fallen out of style over the past few decades. Yet returning to the film's roots seemed like the most natural thing to do. "The original film was one of the great masterpieces of miniature photography, back in the days when it was very common," recalls Alex Funke. "It's nice to see that a production of this status chose to use miniatures to enhance the realism of various scenes. The opportunity to use miniatures in this modern context, that's very exciting."

The VFX team was not excluded from the equation, however. Rather, they were involved in the process from the start. "Denis was adamant on using as many miniatures as possible," recounts John Nelson. "So we picked scenes in which miniatures could be used as a starting point or an end destination in a sequence. That way, we could create CG environments to give scope to the small-scale constructions. In the flight to the LAPD, I used them as a destination. After flying through digitally enhanced aerial shots, we get close-up to the real miniature builds, just like in the old world of *Blade Runner*." The transition between the practical and the digital shots had to then be meticulously graded and textured until they became seamless.

With the 10-hour time difference, it was a logistical challenge to keep everyone from New Zealand to Hungary on the same page. Direct communication was crucial. "We had to know what the director, art director, and cinematographer wanted, and what they liked in terms of shadows and color and so forth," says Alex Funke. "We're all aiming for the same goal – to achieve realism."

At the Weta studio, a large crew painstakingly worked on each miniature, using the 1982 film as inspiration. "They created so much with so little back then, just using black buildings, cardboard cutouts, and lots of smoke," recalls Alex Funke. "So we focused on trying to rebuild this city in the same spirit, just with today's technology. Anything we do will always be held up to their work for comparison, but there are certain things we can do now that were harder to achieve in those days. We hope to at least improve on those aspects." One of the major differences between then and now is technology. Compared to the analog cameras and film stock of the past, these miniatures were shot with digital cameras and computer-controlled motion rigs.

THIS PAGE: Various glimpses into the creative process at Weta Workshop and the incredible detail added to every miniature created for the screen.

RIGHT: Production still of the Los Angeles miniatures as seen on screen.

Careful calculations went into crafting each building to respect precise scale indications. Every structure of the Los Angeles cityscape was then meticulously hand-painted. From individually colored window frames to miniature graffiti on building walls, every detail tells a story and contributes to giving the miniatures texture, depth, and personality. Various techniques were used to properly age the buildings as well, from traditional paint to glossy finishes attained by applying a layer of hairspray. "Many buildings are modern," observes Funke. "But even those are plunked down right in the middle of old, decrepit tenement buildings that are more or less cracked concrete and rusted metal." Even as the crew built and filmed the miniatures, they kept in mind the intent and emotion of the storyline. "We always followed the thesis of the film. Technology and commerce have moved on, but everybody else has been left behind. Living in cold water flats right next to enormous, brand new office buildings."

ABOVE: Spinners were mounted on a computer-controlled hydraulic motion base to simulate flight. Sylvia Hoeks, who portrays Luv in the film, operates a Spinner designed specifically for her character.

THE SPINNER

The Spinner is an iconic element of the *Blade Runner* world, and it was the very first thing the Art Department started designing. Denis Villeneuve wanted the new vehicles to be built in the same spirit as the original film. He insisted on mirroring their characteristics and using the same technology invented by visual futurist Syd Mead, whose conceptual work was so instrumental on the first film. "The Spinner had to be a paramilitary kind of police vehicle," recalls Syd Mead. "It had to fly. So I thought, let's use the principle of an aerodyne, which is internal lift, so it doesn't need a blade to come out or wings." The rest was movie history.

Multiple versions of the Spinner were built for this film. Among them, a nine-passenger limousine was built full-scale, as well as unique Spinners for Luv, Deckard, and Wallace's bodyguards. Two more vehicles were manufactured for Ryan Gosling's character, one to drive and one to fly. "It's an amazing homage to the original, but it integrates elements of brutalism in respect of the style of this film," relays Gassner.

Luv's Spinner, featured on this page, is a luxury car. "It's the Ferrari of Spinners," explains Villeneuve. In fact, these flying vehicles are not a common possession in 2049. Prohibitively expensive for a majority of the population, Spinners are mostly used by government officials, law enforcement, emergency vehicles, and the most wealthy citizens.

ABOVE: In this version of the future, television and computer screens still operate with cathode ray tubes as they did in the'80s. To simulate the effect of the old curved glass screens, the Art Department affixed milled acrylic bubbles to LED screens, creating the desired curvature and distortion.

RIGHT: After an electromagnetic pulse caused a worldwide technological crash, the internet collapsed and society turned to more traditional modes of communication such as phone booths and satellite phones like the one seen here.

TECHNOLOGY

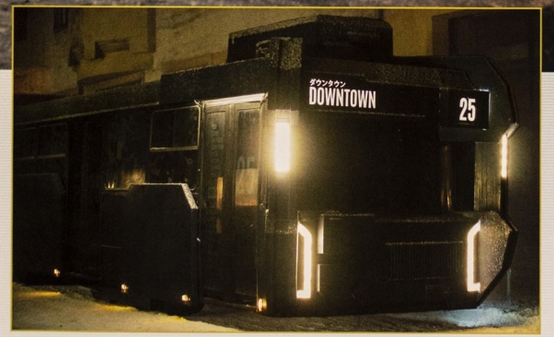
"*Blade Runner* revolutionized science fiction as we know it," says Denis Villeneuve. "Yet today, that revolution has been done, so where do you go next?" One of the many challenges of making a sequel to such an influential film was deciding how to design technology and evolve it in a way that was consistent with the first film. "When Ridley Scott made *Blade Runner*, he was imagining 2019 from an '80s point of view," explains Villeneuve. "To create my own world in this film, I am using Ridley's as a starting point. For example, there was no internet or 16:9 screens in *Blade Runner*, but there were print photos. So I am following those rules." This movie embraces electronics of that time and rejects anything invented past 1982. "The sequel happens in a parallel world in which people do not lead a digital life like we do. It's very inspiring." In fact, such a divergent vision of the future—a society without the internet, smart phones, or social media—felt more disruptive in today's science fiction. Rather than imagining how far technology might advance, it was far more challenging to imagine how it might regress instead.

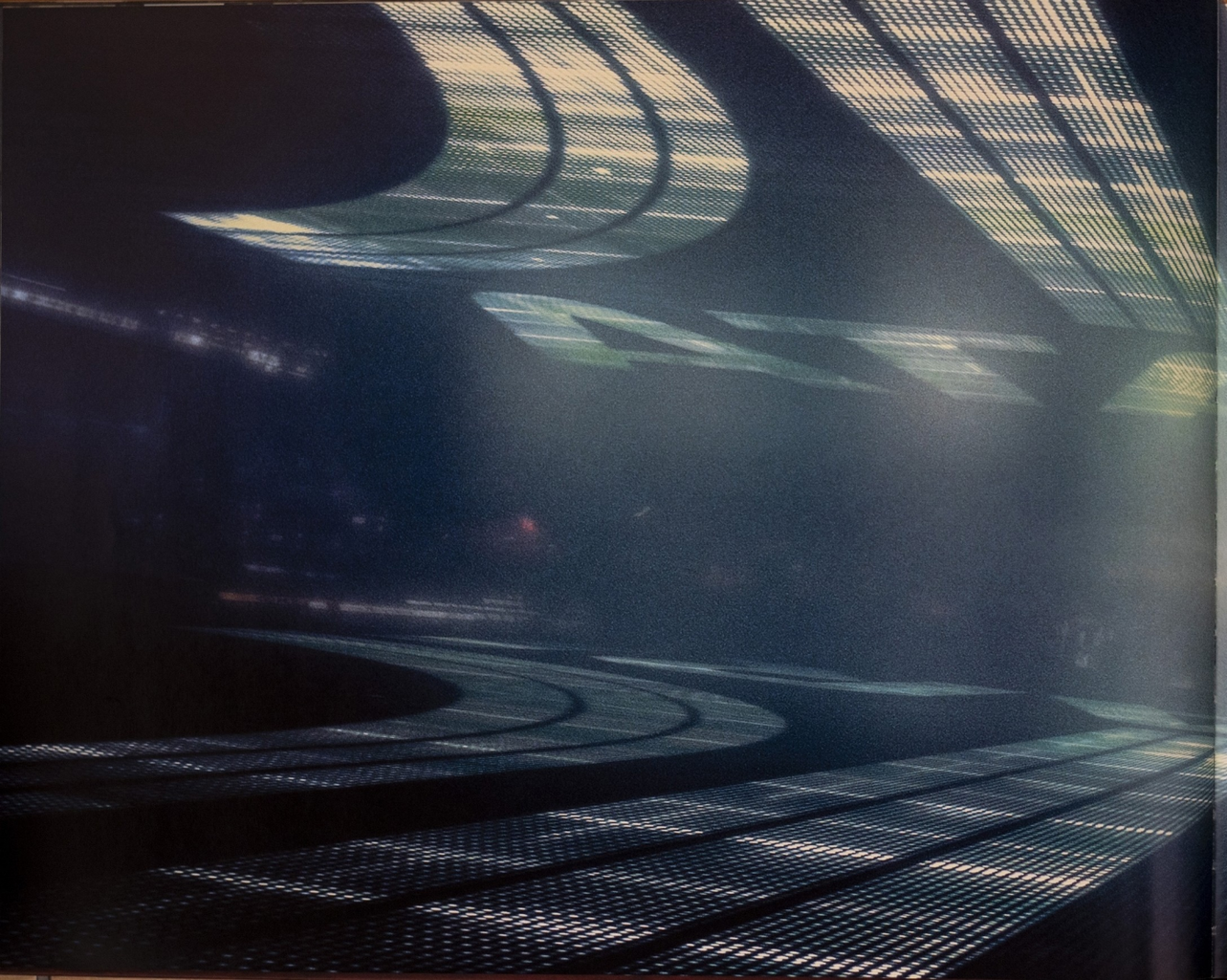
To justify the absence of present-day technology, screenwriter Michael Green came up with an idea. "He imagined that the digital world was attacked," explains the director. "It destroyed all machines and communications, making the entire population weary of using such technology."

This shift resulted in a more analog world, which allowed the creative team to aesthetically embrace machines in a different way. "We were marrying the familiar with the slightly divergent in order to give ourselves a real identity," says Paul Inglis.

Prior to filming, the producers and director met with specialists from a variety of scientific fields to find out if the theories brought forward in the script had any probability of actually becoming reality. "It's where we are going," relays Villeneuve. "We met scientists: doctors, architects, designers, scientists, computer engineers. People who told us what they thought this could be our future. That really inspired us. As we were designing the movie, we tried to do as Ridley did in the first film, which was to project what the world could be like in 30 years."

THIS PAGE: With the scarcity of Spinners in the world, citizens rely on other types of transportation to get around the city. Old, beat-up cars can still be seen on the streets, but people mostly use trams, buses, tuk tuk taxis, and bicycles.

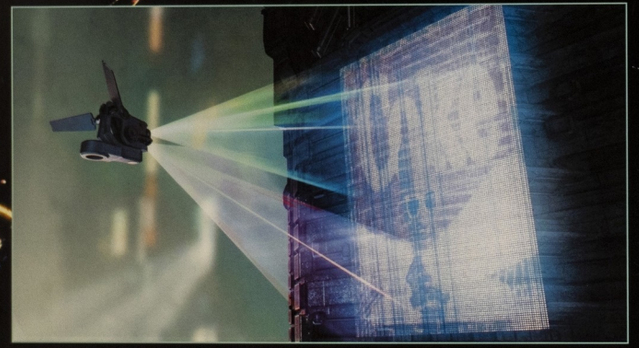




ADVERTISING

Advertising is part of the DNA of *Blade Runner*, so it was only natural to find creative ways of pushing the envelope of this means of expression. The Atari canyon on this spread is one of the most spectacular and direct odes to the original film. "Billboards will be around until the human race is gone," jokes Paul Inglis. "But we had to decide what ads look like in 2049." The sky was literally the limit, as corporate images could be seen in all possible spaces, even cast upon smog, rain, and snow. "The atmosphere is so thick in the city that you can even project images into thin air. In 3D, no less. And that's an extension of our own reality today."

Static billboards are a thing of the past. In this world, commercial images move, transform, and interact with their environment. "We had to take futuristic advertising to another level," says VFX producer Karen Murphy. "Ads aren't simply neon signs on a building. We developed new ways of projecting them, like pods that create holographic enhanced moving images."

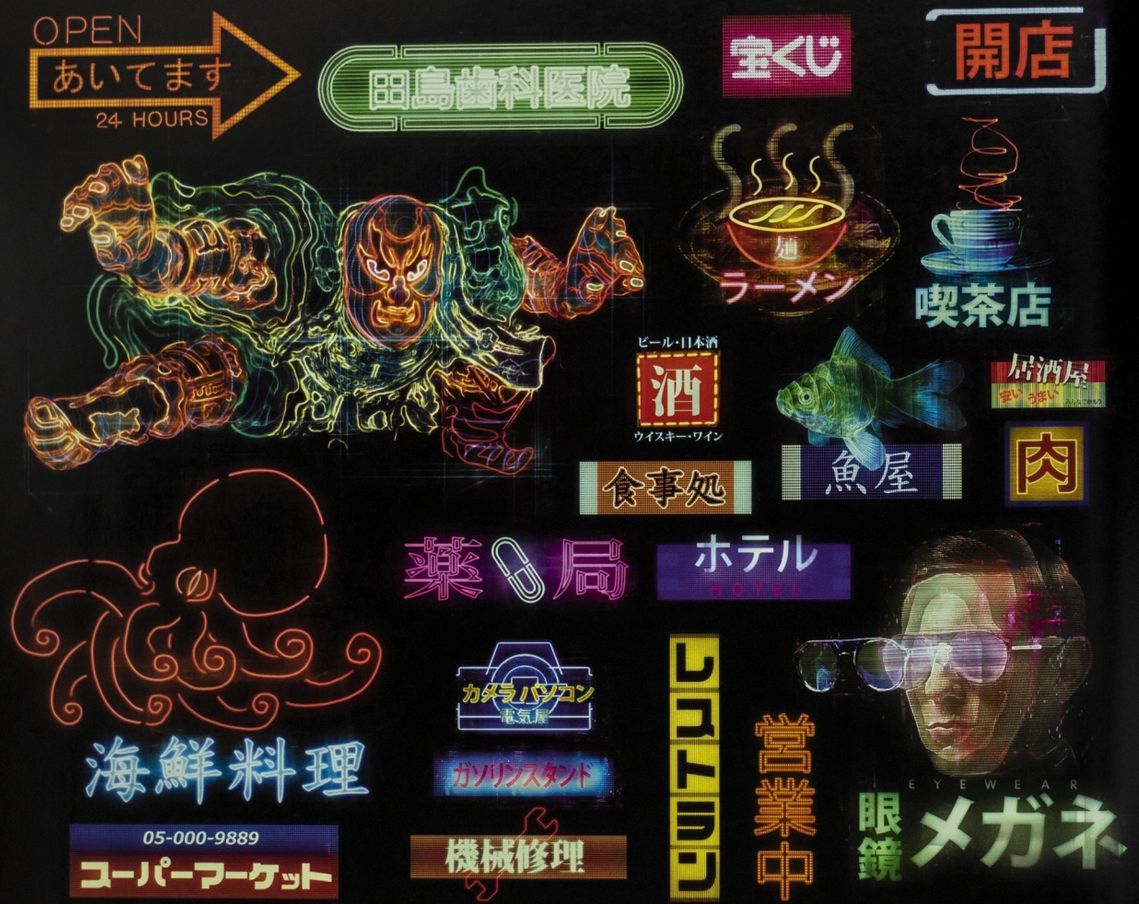


"How do you want to tackle the legacy of the blimp from the first movie?" asked VFX supervisor John Nelson. It was a crucial question. The answer was not trying to replicate it, but rather making something different and new. "We wouldn't have a blimp, but we'd have drones," explains Nelson. You can't escape advertising in the city. These drones are everywhere, projecting digitals billboards upon any surface and then moving on to project them elsewhere, which vastly increases the product's visibility throughout the city.

RIGHT: A variety of different drones were sketched by Sam Hudecki and then built digitally by VFX houses. The idea was to have different designs to show diversity in both technology and design. It added realism because, much like smartphones, they are not all created alike.

RIGHT: The Pink Joi ad is dissected here into separate layers, revealing the many different types of graphics that went into making the final 3D advertisement seen on this spread. This multi-layered approach allowed the director to choose how much of each component to include in the final render, as each frame tells a story on the technology used to project the giant body from a high-rise building.

Some ads are living, breathing entities that target individuals according to their consumer habits. "Advertisements have enough artificial intelligence to sense customers nearby and interact with them directly," relays John Nelson. In the movie, although the giant Pink Joi image was created entirely with VFX, this scene was shot in studio with Ryan Gosling. To get the pink hologram to perfectly light K and the walkway, Roger Deakins used a three-story LED screen, upon which he projected original footage of actress Ana de Armas. "Roger Deakins is a world-class cinematographer," praises Bill Carraro. "I've not worked with a DP as focused and committed to studying the world being created. Everything was done with a thoughtfulness as to what the emotion is, not just where the setting was and how to light it."



THIS SPREAD: Original neon advertisements created for the film.

ECHOES OF THE PAST

THE GRAPEVINE

The opening scene of *Blade Runner 2049* is reminiscent of Ridley Scott's 1982 movie, yet radically different. Most of all, director Denis Villeneuve wanted the first image of his movie to make a statement, in the same way the original movie had. "It was the ultimate dystopian film opening of all time," says Villeneuve. "It took a lot of meditation to find the freedom to allow myself to let go and just dive into a different direction." Instead of opening up to a dark landscape filled with smokestacks, this movie starts with an infinite expanse of plastic. "I came up with the idea of having an artificial landscape under a smoggy sky. It's a claustrophobic image. It also tells us that Mother Nature is dead, having lost the war against Capitalism."

"I SEE SOUP >>> BOILING ON A STOVE..."

—RIDLEY SCOTT, CREATOR OF ***BLADE RUNNER***

The boiling soup in the first scene is a direct homage to Ridley Scott and Hampton Fancher. Denis Villeneuve wanted to salute the original *Blade Runner* director and screenwriter by filming a scene they had written together over 30 years earlier.

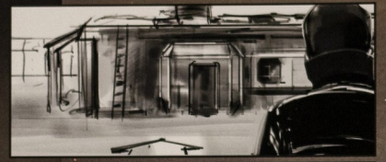
"We came up with Sapper Morton and the farm scene for *Blade Runner* 1," explains Ridley Scott. "This guy turns up to interview him at this ramshackle *Grapes of Wrath* type of farmstead in the middle of massive flatlands with a tree, a dead tree."

Hampton Fancher recalls the exact sequence of events as they were constructing the *Blade Runner* world back in 1980: "One afternoon, Ridley said, 'What do you think Deckard did before doing what he does in this film?' I said, 'What do you mean? Like was he a plumber or something?' He said, 'No, no, he was retiring Replicants. But what kind? It must've been Nexus 6 or 5 or 4. Who were they?' 'They were probably like Steel-heads,' I called them. And then, right away, Ridley said, 'I see soup boiling on a stove.' And I said, 'Don't say anything more. I'll see you tomorrow.' I wrote a scene and I watched Ridley read it. I could tell, I hit gold."

The Sapper Morton scene was written as the opening sequence for the original film, but Ridley Scott felt it didn't tie in with rest of the storyline. "An offhanded idea," recalls Fancher, who published a short story inspired by the scene called "*The Shape of the Final Dog*" in 2012.

Over three decades later, it became the introduction to *Blade Runner 2049*.

PUSHING TOWARD FARMHOUSE



K ENTERS

FROM INSIDE HOUSE - THROUGH RICKETY SCREEN DOOR

K OPENS EXT DOOR TO VESTIBULE

CUT
STRANGE (YELLOW) LIGHT IN VESTIBULE

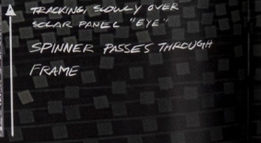
LOS ANGELES HILLS

The universe of *Blade Runner* has changed considerably. The notion of countries has vanished, as megacities have become the only habitable territories. Los Angeles is one of these megacities, with its borders now spreading from San Diego to San Francisco. Desperate to find food and safe housing, civilians have moved to this urban area to escape the suburbs, where rising ocean levels have caused severe damage. "Suburbs are empty and in decay," says Denis Villeneuve. "Populations converge on the megacities in order to survive on Earth."

The result of this mass city migration is overpopulation. The Los Angeles Hills (seen above) are no longer covered with lush greenery, but instead with buildings crammed next to each other occupying every possible piece of land. There is no room left, not even for nature.

"We filmed aerial shots of Mexico City to double up as a futuristic Los Angeles," says Denis Villeneuve. "It has the same kind of hilly topography, as well as very high population density."

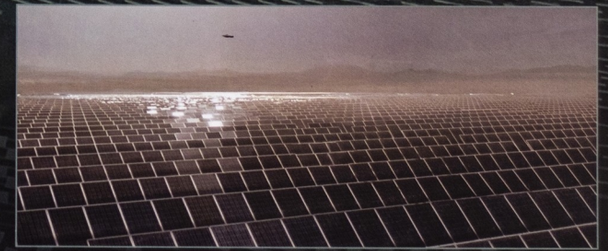
As we leave the city, we dig deeper into this world and discover its hidden secrets. "There's always something upsettingly plausible about the future you see in *Blade Runner*," says screenwriter Michael Green. "Even moreso seeing it through Denis Villeneuve's and Roger Deakins' lens. You start to think, we could get to that point. And as much as we want a flying car, there are other things that would be frightening to see."



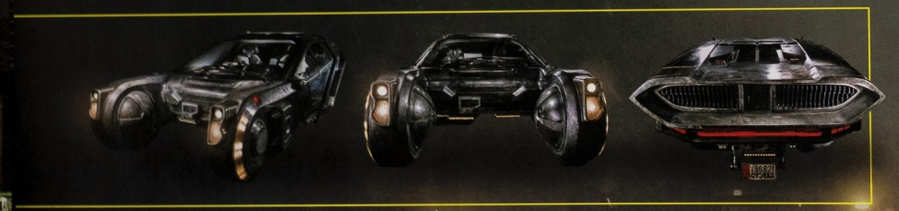
ABOVE: The Spinner soars above the endless solar fields of the California Grapevine. "It reminds me of David Lean movies," says VFX supervisor John Nelson. "Such fine detail within a very wide shot, which gives the landscape a sense of immensity."

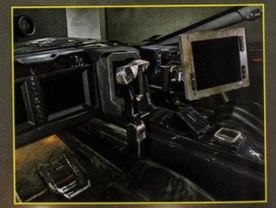
RIGHT: This concept art is inspired from actual solar farms observed in the California desert, more specifically the Ivanpah Solar Power Facility.

LEFT: Sam Hudecki's boards carefully detail the Spinner's trajectory over the plastic landscape.



ABOVE: The Pilot Fish is a reconnaissance drone used by police forces for crowd control or investigations in dangerous areas. It can stand guard, scan a crime scene, and follow vocal commands given by a police officer. It's basically an evolution of the K9 dog, without all the grooming. When this drone detaches from the Spinner, it can fly in any weather conditions, even the strongest storms.



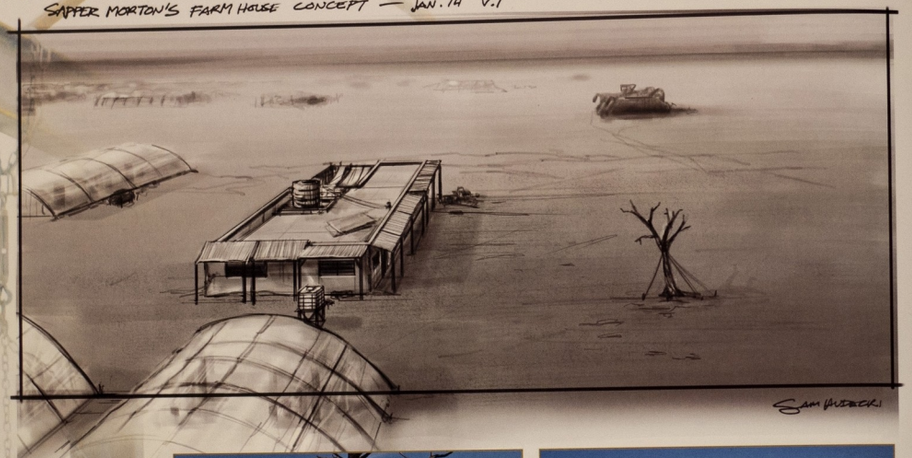


RIGHT: In the top image, we see a rare glimpse of the Spinner's undercarriage as it is being held in suspension by a crane. From this perspective, we can see the retractable wheels of the vehicle and its transparent flooring. Below, the Spinner is being filmed by a camera installed on a jib as it is lowered to the ground. At the bottom, the Special Effects Department simulates a cloud of dust as the vehicle lands at the farmhouse.

K'S SPINNER

The LAPD has a full fleet of emergency vehicles such as the one seen above. K's Spinner is different. He is assigned an old, beat-up, unmarked police Spinner to discreetly conduct his investigations. From the exterior, only the visible Pilot Fish installed in the roof distinguishes it from other nondescript Spinners. Yet inside, it boasts all the amenities of a police car: a communication system, a bio-scanner, and an armed cannon concealed in the hood.

The Art Department started working on the vehicle's design early in pre-production, refining the concept as Villeneuve steered them towards more brutal lines. Two versions of K's Spinner were built in the UK and shipped to Budapest for principal photography. One version was a battery-powered car that could be driven up to 50 miles per hour. The other was built for interior shots, featuring practical props, doors, and lights. The latter was also used for all flight simulations by being suspended by wires or installed onto a hydraulic gimbal. As an added bonus, the wheels of this model retracted when it was airborne.



THE FARM

Officer K is living a routine life when a new assignment brings him to the farm of an old Nexus model long off the grid. The future collides with the past both literally and metaphorically, as these two generations of Replicants meet. As the scene was written by Ridley Scott and directed by Denis Villeneuve, it serves as a powerful, symbolic passing of the *Blade Runner* torch from one director to his successor.

In Denis Villeneuve's dystopian future, natural resources are non-existent, and humans rely solely upon artificial agriculture to survive. On the edge of the megacity, Sapper Morton cultivates a high-protein food source called Nematodes. These small, white, stubby worms were biologically designed by Wallace Corporation to become the principal source of nourishment in the world. They are farmed in pools of dirt under plastic-domed tents to protect them from outside pollution. Some farmers, like Sapper, use additional bioreactors to fertilize their harvest. Denis Villeneuve was thrilled to introduce an exotic farming technology that looked like nothing we'd seen before. "Nematodes are very resistant and easy to grow," he explains. "More importantly, they offer high return on investment."

Denis Villeneuve loves to see hand-drawn sketches that bring his vision to life, such as Sam Hudecki's early layout of Sapper Morton's farm (seen above). The house and greenhouses were built from scratch, as was the dead tree made of polystyrene and real tree bark. The entire farm was built on the backlot of Origo Studios in Budapest where the scenes were shot in October and November of 2016.

TOP: This concept art features a Nematode farmer working in a greenhouse, looking up to see an unknown and unexpected visitor approaching.

ABOVE: Still photography from inside one of the greenhouses built on the studio lot, with a practical sludge pool and bioreactors filled with green fertilizer.

RIGHT: A closer look at the farmer's decontamination suit and breathing helmet. He holds a sludge rake used to trap Nematodes and assess the quality of the harvest.

SAPPER MORTON

Sapper Morton is an old Nexus model gone rogue. After serving in the military on Calantha, he came to Earth to start a quiet solitary life on a 220-acre protein farm. For decades, he was living reclusively until K arrived looking for model number NK680514, wanted for multiple crimes. "Sapper is frozen in time," says Dave Bautista on his character. "As a Replicant, he just wants to continue living life. He doesn't want to bother anybody, and he doesn't want to be bothered. He's just trying to exist."

Dave Bautista was recruited to play the old Nexus model, made for hard labor, war, and battle. "I needed someone who could play a giant, but a gentle giant," recalls Denis Villeneuve. "Sapper needed to be benevolent, but also potentially very dangerous. Dave gave the character a sense of melancholy and vulnerability, so when you first see him, you feel empathy for him." Bautista wasn't an obvious choice for the role, however. The character was written as a 60-year old Replicant, but Dave Bautista was much younger. "I flew out from Atlanta to meet Denis Villeneuve and right off the bat he tells me, 'I hate to tell you, but you're too young for this role.' Through my experience in Hollywood, I've been told I'm too big or too old, never that I was too young."

Fortunately, the story doesn't end there. Delighted by their meeting, Denis Villeneuve asked make-up artist Donald Mowat to work his magic and make the actor look older. The results were conclusive. "We could have used a more prosthetic-driven make-up to age Dave, but it had to feel organic," explains Mowat. "So we did a very traditional stretch and stipple latex makeup, which also made him look pale and a bit gray." Villeneuve knew they had reached perfection when people would tell him, "Oh, I didn't know Dave was that old." They weren't seeing the make-up effect, just an older Dave Bautista.

>>>"HE'S FROZEN IN TIME AND HE WANTS IT THAT WAY."

—DAVE BAUTISTA, ACTOR PORTRAYING SAPPER MORTON

THIS PAGE: Sapper Morton's agricultural gear had to reflect the high toxicity levels of his environment. "A lot of work went into Sapper's costume," explains Sam Hudecki. "There were numerous permutations on the helmet alone." Fabricated by Ivo Coveney, Sapper's helmet had to look industrially designed. They achieved this by concentrating on straight lines and minimal facets. The costume was tweaked right up to the day of shoot, when a few layers of patina turned it from a bright yellow to a dark ocher, better reflecting the mysterious nature of the character, according to Villeneuve.

>>> "HE'S A STRANGER IN A STRANGE LAND."

—HAMPTON FANCHER, SCREENWRITER

K

Officer KD6-3.7, or K for short, is the latest Replicant model manufactured by Wallace Corporation. He's an LAPD Blade Runner, created to retire dysfunctional, uncooperative, or unreliable Replicants. "The profession of the Blade Runner is more complicated than it was in the first movie," says Ryan Gosling. "The major distinction between my character and the characters in the original film is that not only does K know he is a Replicant, his burden is to know that his own existence rests entirely on killing other Replicants, who value life as he does. This creates a moral conflict for him, one that he must hide or risk being 'retired' himself."

Replicants, and society's relationship with them, have also changed since the first film. To track their evolution over the past 30 years, Villeneuve developed a *"Rule Book"* to update the world's official canon and envision new advantages and challenges alike. Replicants still appear human and possess genetically engineered enhancements, such as superior human strength and mental capacities. Instead of restricting their life cycles to only four years, Replicants also now enjoy a normal human lifespan. However, Replicants suffer from new emotional and societal limitations as well. While they now age naturally and die of natural causes, Replicants are brought into the world as fully-grown, infertile adults bred only to serve. "Replicants are still produced as slave laborers with limited rights," says the *Rule Book*. "Though allowed to live on Earth among the human population, they're perceived as abominations and third-class citizens." Consequently, many wrestle with undeveloped emotions as they struggle to understand and accept their place among humans. "They are considered very different, because humans are born and Replicants are manufactured," explains Michael Green. "The qualitative difference between the two is that someone born is thought to have a soul, while someone manufactured may perhaps not. This film explores what it means to live in a world feeling like you don't have a soul, and starting to want one."

The soul-searching Replicant is played by Ryan Gosling. The actor met Ridley Scott three years before the movie went into production, and when Denis Villeneuve came on board he agreed that Ryan was the best actor for the role of K. "It was a big leap for him," says Villeneuve. "He had always refused superhero-type blockbuster movies, and I saw that as a big quality for this film."

Harrison Ford didn't have the luxury of knowing whether or not Deckard was a Replicant. Ryan Gosling did. You could always tell when he came to set in character. It was very subtle, he would stand straighter and be a little quieter. "Being K is a very dark and lonely experience," explains Gosling. "I tried to remind myself of that, but it was difficult because I was fulfilling a childhood dream to be working on a film of this magnitude, alongside talented people like Denis, Harrison, Ridley, and so many others. But my character's reality was a nightmare, and I had to remind myself of that daily."

Ryan Gosling was on set every single day. If he wasn't in front of the camera filming his scenes, he was dropping by to visit the director and the crew on his rare days off. "They created this incredible world with fully-functioning sets and props," recalls Gosling. "It was a living, breathing universe. And it was impressive. I would spend as much time in the world as I could, while we were shooting and beforehand. That way, I was able to react as though I'd never known anything else."

"I wouldn't have been able to do *Blade Runner 2049* without Ryan Gosling," confides Denis Villeneuve. "As a director, I always try to find a muse on my projects, someone who will become an inspiration and a driving force behind what I'm trying to capture. Ryan became that muse very quickly."

During the first week of principal photography, Ryan came up with a metaphor that stuck throughout the ninety-five days of filming. "*Blade Runner* is a film that Denis and I loved when we were younger, and felt we were delving in our collective memories," said Gosling. "That process was helpful for me, because the film is so entrenched in the power and meaning of memory. It's like we saw this movie when we were kids, and we're trying to remember it and relive it together."

Denis embraced this idea, and often compared their creative process to archaeologists digging up a long-forgotten film. "Ryan's passion and relentless efforts deeply moved me, because I felt it was as important to him that we succeed. At the very beginning, we agreed that working on this project was a privilege and we pledged to make this movie as a pure artistic gesture."

RIGHT: K's Blade Runner gear: LAPD badge, police LED ID, blaster, and mini-reader. These props were custom designed by prop master Doug Harlocker and his team. "K's gun is a new generation blaster. It went through a number of incarnations as well as ergonomic studies." He also realized the director's vision of the mini-reader. "It's an analog slide reader reminiscent of the first movie, when Harrison Ford takes a Polaroid and puts it in a machine that allows him to zoom in closer and enhance."

>>> "HIS SOLE PURPOSE IS TO
# KILL HIS OWN KIND.
SO, NOT A DREAM JOB
BY ANYONE'S STANDARDS."

—RYAN GOSLING, ACTOR PORTRAYING K

RIGHT: K's coat became an iconic image of *Blade Runner 2049* the day it was revealed publicly. While earlier designs were longer and sleeker, it was changed to tell a clearer story about the cold and harsh world he lives in, explains Ryan Gosling. "Since K has very little by way of objects to call his own or to reflect his inner landscape, his coat was one of the only opportunities to try to reflect the utilitarian nature of his existence."

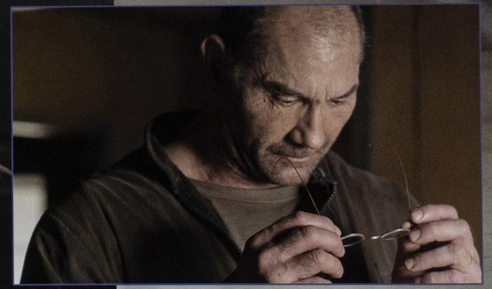
When K arrives at the farmhouse, he experiences an unexpected shift in his psyche. To see another Replicant living a life of relative freedom comes as a shock to this obedient and submissive Blade Runner. Sapper Morton not only works on his farm, but he also grows garlic and flowers for his own enjoyment. He even owns an antique piano. All luxuries in this world, especially for a Replicant.

"It's complicated for K, because he respects the life this Nexus has built for himself," explains Gosling on K's inner turmoil. "He notices that Sapper has an appreciation for the finer things, and even what appears to be a soul. I think that sends my character into a bit of a psychological tailspin."

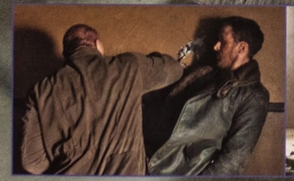
Sapper and K face off in a fight of survival for the former and of duty for the latter. "It's a cat-and-mouse game," says Dave Bautista. "You see the obvious physical size difference between my character and Ryan Gosling's, but the new models are that much more superior."

Hampton Fancher describes the technical evolution between Sapper and K by comparing them to a blunt razor and an electric shaver. "Sapper has been on the run a long time. He's a bear. And a hunter has come in acting like a salesman. So when Sapper figures that out, 'Sapper the bear' decides to take care of business and he's not up to the task."

What began as a routine assignment for K turns into the beginning of his inner journey. "K is like a technical handbook that becomes a poem because of pain," says Fancher. "That theme is at the heart of the first *Blade Runner* as well. It's a theme in all our lives."



Roger Deakins' lighting in the farmhouse is the epitome of film noir. Some actors would only visit sets after they had been lit by the cinematographer, because he transformed every set and location, giving them a soul and bringing them into the world of *Blade Runner*.



BELOW: Sapper Morton and K engage in a vicious Replicant duel, two generations measuring up their strength and agility. K overpowers the old Nexus model and forces him to look up and to the left, allowing him to scan Sapper's ID code burned into the bottom of his right eyeball.

SHADOWS AND LIGHT
THE STREETS OF LOS ANGELES

What is it like living in this dystopian future? The streets of Los Angeles offer a glimpse into the daily life of its inhabitants. Capturing the essence of the world within these scenes was a major endeavor for cast and crew alike. "The tough conditions we had to work in at times paled in comparison to the harsh conditions our characters live in," says Ryan Gosling. From blizzard-like winds to pouring rain, they experienced it all. "I was grateful that our comfort wasn't made a priority. It would have made it more difficult to communicate the brutality of the world."

NEON NOIR

Blade Runner offers a projection of the future, but the artistic approach has never been pure science-fiction. It's film noir. This movie exemplifies this cinematic style, with expressionistic lighting, dark silhouettes, atmospheric haze, and an underlying sense of doom. Yet in this bleak world, bursts of color do occasionally appear. Bright lights, neon signs, and holographic ads create a strange dichotomy between desperation and hope. Darkness and light. Call it ***Neon Noir***.

"There are only a few scenes that allow color, and it's very powerful when they occur," explains Dennis Gassner. "Color excites our senses before we dive back into the darkness." The dark tonalities and fatalistic undertone served as a guide in all of production design. "Dennis always kept in mind that this wasn't really a science-fiction film, but a film noir," recalls Camille Verhaeghe. "It's all about shadows and light. Our design of the film was an unconscious reaction to knowing how important light would be. That had a big impact on all the sets."

"Sci-fi" was a word very seldom used on this film, almost taboo. Probably because the spirit of this film wasn't about cool, new gadgets of the future, but rather a dark, tragic story reflecting on our own existence.

"This film is a master class of silhouette," says editor Joe Walker. In this scene, where K walks behind a snowplow to get home, meticulous preparation went into creating the central source of light behind him. No detail was neglected for the night shoot, which took place on a street in downtown Budapest. Practical moving lights were even set up to imitate the flight of Spinners above. "With Roger Deakins, everything is done with tremendous intelligence, purpose, and specificity," says Walker. "It's no accident it looks this good. Every morning, I slaughter goats to thank the gods that I'm the guy who gets to cut Roger Deakins' photography. [LAUGHS]"

This world offered new possibilities for Denis Villeneuve and Roger Deakins as a team. "We had made two movies together that were inspired by strong realism," explains Villeneuve. "So I told Roger, 'This time you can go in an impressionistic direction. You're totally free. You can do whatever you want.' And I think he did some of his best work on this movie. And we're talking about the best work of one of the best cinematographers of all time." From developing storyboards to designing the world and filming on set, their combined vision resulted in a reinvention of *Blade Runner*, all while honoring the original. "The film makes you feel as though humanity is almost at its end," says Ryan Gosling. "Yet there's a romantic quality through the lens of Roger and Denis, which makes for a very interesting and iconic experience."

>>> "THIS ISN'T REALLY A SCIENCE-FICTION FILM. IT'S A FILM NOIR. IT'S ALL ABOUT SHADOWS AND LIGHT."

—CAMILLE VERHAEGHE, ASSISTANT PRODUCTION DESIGNER

STREET MARKET

This scene holds the key to understanding what it would feel like to live in the world of *Blade Runner 2049*. The marketplace offers a wealth of information on how people travel, eat, dress, shop, and socialize. Bundled up in their fashion-forward winter gear, people from all walks of life converge here to purchase whatever they need and just as quickly retreat back to their heated buildings. Dense crowds swarm walls lined with kiosks and vending machines selling everything from pre-packaged meals to prescription drugs. Trains pass overhead as tuk tuks make their way through the crowds. And advertising appears everywhere, competing for the short-spanned attention of passersby in a chaotic neon cacophony.

The Market was built as a full-scale set, packed with up to 400 extras bustling through the narrow walkway on set. "I'm a director who needs tangible sets, objects, and props," explains Villeneuve. "Real environments are inspiring and trigger ideas. My movies are not designed by computers, they are dreamed by actors first." Avoiding green screens was strongly supported by Alcon. "Denis doesn't like green screen. Fortunately, neither do we," says producer and Alcon co-CEO Andrew Kosove. "Ultimately, movies are about connecting to characters, so everything that further connects you to a character is helpful. I believe it'll pay off, because your eye understands on some innate level when you're looking upon something that's real."

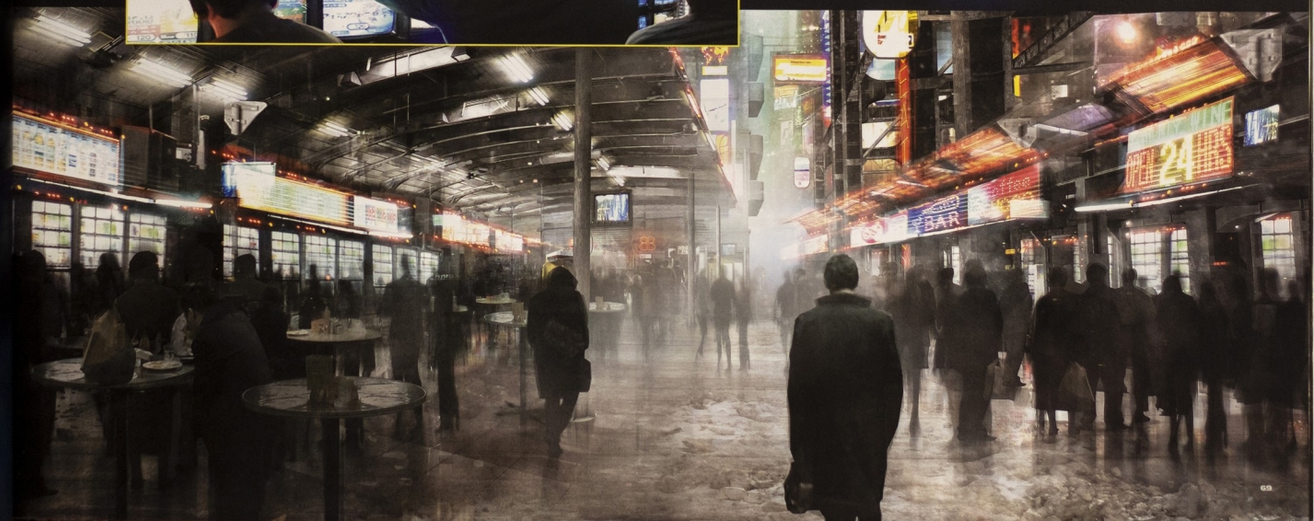
In the original screenplay, there was no street market, only a bar named Bibi's where people have sex just as casually as they would a conversation. Denis Villeneuve wanted to keep the bar in the scene, but he also wanted to add a pedestrian area to feel the urban life. On this page, the concept art for the city streets and Bibi's Bar were the original source material that created the mood and visual signature of the marketplace. Executive producer Bill Carraro was witness to the transformation. "Denis wanted a gathering place where you can buy anything you can imagine: food-wise, gadget-wise, even sex. In the future, sex and sexuality aren't taboo. So it's natural to go into a bar and, before getting a hamburger, having some sex."

Denis Villeneuve made it clear that Bibi's Bar is not a brothel. The purpose of the establishment is to offer a safe and playful environment to have sex with friends, strangers, or significant others. Prostitutes are readily available should they be requested, but they are not at the heart of this business. In the mythology of this institution, the director insisted that the bar should be open to female and male customers alike. The challenge was finding extras to play in the scene. Even though they were only seen as silhouettes behind smoked glass, it was hard to find average people, as opposed to erotic dancers, who would agree to be (or appear to be) naked on a film set and simulate intercourse. Luckily, they found daring enough people for the part in the end.

THIS PAGE: The Art Department merged Bibi's Bar and the Market idea into one giant set. What tied everything together was the canopy, which sheltered the vending machines and eating area while creating a vanishing point leading to the bar. It also gave a sense of scope to the world, by hinting at the walkways and skyscrapers above. Dennis Gassner's team created 3D miniature models to ascertain the director's vision before building it. "The concept art and models helped us define the look of Bibi's Bar and market. They also supported the director with developing the action on set."

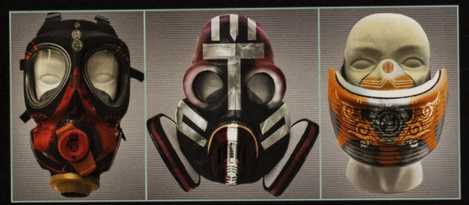
This scene was first storyboarded and then further developed by concept artists, who imagined all the infinite details. "The smoked glass with the figures behind it was something Denis proposed and always knew he wanted," recalls Paul Inglis. "The vending machines were imagined as a series of old-fashioned screens with biometric elements. With the touch of a hand, you can purchase an item without cash or coins being deployed. These vending machines further emphasize that pre-packaged and processed goods is very much what this world is all about."

The concept art also established the color palette and the plethora of advertisements. Since Los Angeles has diversified over the past three decades, companies are now catering to an international clientele. Neon signs are not only written in English, Chinese, and Japanese like in the first movie, but offer a variety of other languages such as Korean, Russian, and Hindi.



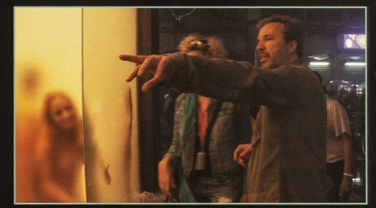
LEFT: Denis Villeneuve didn't want the extras to wear a different version of the same costume. Like in real life, he wanted every one of them to express an individual style. The wardrobe department therefore designed, sewed, and fitted several hundred individual costumes.

BOTTOM LEFT: Elaborate breathing masks are the signature style of many Los Angeles citizens. "The people in our movie live in this dark, polluted, rainy world," says Doug Harlocker. "Most of them wear some form of oxygen or particle mask. Denis really liked the ones that made people look, at a glance, very odd. So we started embellishing them, as if people personalized their own. We made 200 masks and they were all different."



The extras working on *Blade Runner 2049* were not randomly selected, far from it. "Denis selected those hundreds of faces," recalls Bill Carraro. "In all, about 2,500 different extras were handpicked for the movie. And he wanted to see each one." The director sought unique, mournful demeanors that would reflect the mood of those surviving on Earth. For inspiration, Villeneuve also turned to the photography of James Nachtwey. "I like to find inspiration in real life to create fiction. I aim for truth, even in science fiction."

Looking to reality was also part of Ridley Scott's process in creating the dystopian style of the first movie. "People always asked me, 'Why was *Blade Runner* always bleak and dark?' I said, 'Because it *is* bleak. If you walk outside, open your eyes. You'll see that it's dark!' So I thought *Blade Runner* made sense, because that's where we're headed."



The city market was one of the biggest sets built for this movie. It had vending machines lining the walls of the canopy that covered the eating area. With its luminous window, Bibi's Bar occupied the ground floor of a three-story apartment. A street divided the stage in two parts, and across it, other vending machines covered a wall under the train overpass. And at the opposite end of the set, a two-story LAPD observation deck towered over the crowd and dozens of market stalls.

During the four days of shooting on this set, the Special Effects team made it rain non-stop. "We had these very ambitious ideas that seemed charming on paper," says Michael Green. "And it was great, because then someone else was responsible for actually doing them. [LAUGHS]"

Most humans still living on the dying Earth are unfit to colonize the Off-Worlds, either too sick, too old, or too poor. They are, in a sense, refugees. The citizens of Los Angeles are therefore mostly poor, working-class people, simply trying to survive in this dismal environment. Denis Villeneuve wanted their clothes to reflect their hard existence. "I came up with the idea that fashion in the future was linked with winter," recalls Villeneuve. "People express their individuality and creativity through clothing, and, in this case, through their relationship with winter. They incorporate survival gear into their wardrobe, making them fashion statements."

The director worked with concept artist Sam Hudecki to design wardrobe and props for this scene. Their goal wasn't merely to create outfits with the proper wear and tear. Each costume had to be unique and tell a story of its own. "In the first film, the style was Asian-influenced punk," shares Sam Hudecki. "For this one, it's more brutalistic Russian. We coined a term actually. We called it 'Urban Snow Trash'."

Costume designer Renée April had worked with Denis Villeneuve on three other movies before joining him on this production. "The first *Blade Runner* was filmed in the '80s and the fashion of the time influenced the style of the costumes. For this one, we wanted to design clothes that reflected our reality," says April. "We played around with lights, fiber optic, and LEDs. I didn't want to work with leather, wool, or anything that wouldn't exist in this world, so I had fun with synthetic materials such as plastic and fake fur."

On some shooting days, there were up to 400 extras on set, a daunting challenge for the costume, make-up, and hair departments. "We borrowed some ideas from the first film and modified them to make them our own," says make-up designer Donald Mowat. "We dialed things down a little bit and brought it back to a style that is more familiar with what we do today."

THIS SPREAD: From sketches to final realization, these images offer an exploration of the creative process behind the design of the "Urban Snow Trash" fashion style. Sam Hudecki drew scenes illustrating the daily lives of people in this world. "I would sometimes deliver sketches to wardrobe or props, and they would ask me, 'How are we supposed to build this?' I'd just shrug and apologize. 'I don't know. I just draw them.' And somehow they always figured out a way to bring them into reality."

THIS SPREAD: It was a warm and sunny Hungarian August day outside. Yet inside the studio, the Special Effects team had dropped the temperature. It was cold, misty, and raining non-stop. There was even snow on the ground. "I think it's important for the style of the movie to have these practical effects," says SFX supervisor Gerd Nefzer. "Especially for the way they were shooting this film with Roger Deakins' lighting. You need real elements there. You can't fake that."

Four hundred uniquely dressed and styled extras followed careful instructions to create a perfect take. On "action," the tuk tuks and snow plow began their journey through the moving crowds. In the darkness and out of sight, an army of crew members silently guided the extras, keeping the street traffic looking alive and natural as the principal actors filmed their scenes. Cast and crew followed this routine for four days straight, repeating the different choreographies over and over.

In its final render, the set was embellished with flying drones and holographic adverts. The VFX team also added scale with set extensions, which extended the city lights into the distance. "We wanted that sense of scope, using the tools of today without abusing visual effects," says VFX producer Karen Murphy. "We didn't want to distract the audience from the story. We wanted to augment this world, a world you want to live in."

RIGHT: As this shot was being set up by the crew, Ryan Gosling was given noodles to eat during the scene. Both he and the director felt that eating noodles was a "very Deckard thing to do." Always on their toes, the prop team quickly switched the noodles with a bowl of rice.

THIS PAGE: Doxies work and move like a pack of wolves as they approach a prey. "Renée April blew me away," says actor Mackenzie Davis about Mariette's costume. "It made such a difference to getting into character. The see-through rain jacket evoked a mix of exposed sex economy meets cold weather. I loved it."

"SHE IS SEARCHING FOR A REASON TO PERSEVERE."<<<

—MACKENZIE DAVIS, ACTOR PORTRAYING MARIETTE

MARIETTE

Mariette is a Doxie, a Replicant pleasure model designed to satisfy sexual urges. Mackenzie Davis plays the seductive yet sweet Replicant ordered by Freysa to uncover information about K. "Mariette is a part of an organization of hopeful Replicants," explains the actor. "They know there's a future for them, that they're not disposable." Denis Villeneuve selected Mackenzie Davis early in the casting process. "She was the most obvious choice for the role. She's one of the best actresses of her generation, plus she looks like she could be Daryl Hannah's little sister." Although she plays a Doxie, the character created by Mackenzie Davis is playful and a little mischievous. "Being on that set was surreal. Once in a while, I'd look around and think, 'Oh damn, this is the coolest thing in the world.'"

>>>"IT'S A LIVING, BREATHING UNIVERSE."
–RYAN GOSLING, ACTOR PORTRAYING K

MOEBIUS 21
K'S APARTMENT COMPLEX

Standing at street level and looking up, towers rise as high as the eye can see. This early concept art reflects the original vision for Moebius Apartments, number 21. This is where K lives, an old office building retrofitted into affordable housing. "I named the tower after the French cartoonist who inspired the first *Blade Runner*," explains Denis Villeneuve. "Ridley Scott was directly influenced by an illustrated short story called *The Long Tomorrow*, published in the 1976 comic book *Heavy Metal* (*Métal hurlant*). Moebius, whose real name was Jean Giraud, has also been a major source of inspiration for me. He was a master of science fiction."

ABOVE: These storyboards capture every beat of the camera tilt down, revealing the scale of Moebius Apartments. The height of the building accentuates how small humans appear, and probably feel, in this world.

HOME SWEET HOME

Over the past 30 years, the climate has changed dramatically in this world. It was a very conscious choice by the director to turn Los Angeles into this cold city. "The first movie was inspired by rainy days in London, where Ridley is from," explains Denis Villeneuve. "I'm from Montreal. So the movie is inspired by cold winter days, where it snows, rains, and sometimes both at the same time. That brought on a different visual approach in the atmosphere and the color palette."

The snowstorm was shot in downtown Budapest on a warm September night. Several city blocks were closed off to allow the crew to set up and film through the night. Dennis Gassner had designed a faux relief structure with signs to add texture to the brutalist concrete building.

Over the front door, Japanese letters read Moebius 21. Why twenty-one? "I selected that number to echo a specific scene in the first movie," admits Villeneuve. "But I will let the fans find the answer to that riddle on their own."

TOP RIGHT: Gerd Nefzer and his Special Effects team called on a "snow business" specialist to cover two city blocks with paper snow and simulate a blizzard. In the middle of the night, powerful fans were blasting the snow down the street. And it was the best kind of snow, because it wasn't cold.

RIGHT: The director asked to have a Volkswagen Beetle in this scene. Having a vintage car in a world of Spinners reflects the resourcefulness of people living in 2049. They get by with what they can get their hands on. Many films don't take into account cars produced before the period a movie is set in. This movie embraces the past, as real life usually does.

BAZAAR WAY OF LIFE

Director Denis Villeneuve and his team of world-builders spent months dreaming up every little detail of this world. Many of their ideas were realized on-screen, but one corner of the world that viewers may never get to explore is one of the omitted scenes featured here.

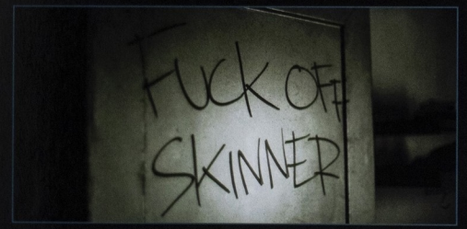
In Villeneuve's vision of 2049, even the poorest can't afford to be homeless due to the cold and unstable weather outside. Men and women retreat to heated buildings and find a corner to call their own. Inspired by the Hong Kong housing crisis, some people live in 6' X 2' metal cages in the lobby. Others claim safe spots in basements and stairwells for makeshift beds and small fires to keep warm. Even the hallways are lined with bazaar-like stands, where you can get just about anything you need: getting your teeth fixed, buying food, all types of scavenged and refurbished items. Denis Villeneuve envisioned this interior marketplace as an echo to the snakeskin scene in the first movie, with people using up any available space to make a living.

"No one complains about the chaos because it's convenient," explains actor Barkhad Abdi, who portrays Doc Badger. "Everybody has access to what they need right across the hallway." The Somalian actor plays a working man with many tricks up his sleeve. K turns to him to uncover more information about a piece of evidence. "He scans objects to find out where they're from. He also knows how to sell and buy anything. That's how he makes a living."

TOP LEFT: These small, metal cubicles are big enough for one person, and they can be stacked atop one another to maximize housing space.

TOP RIGHT: The apartment hallways were shot at Ves School in Budapest. The crew built dozens of stands to turn the location into a bazaar. "The vendors included old technology, food, algae, and all kinds of unusual products," explains set decorator Alessandra Querzola.

BOTTOM: Barkhad Abdi doesn't speak English in the film. He has a full conversation in Somali with K, who understands every word. "In this world, we realize that there is no language barrier. It's amazing," says Abdi. The concept was introduced by James Edward Olmos in the role of Gaff in the first *Blade Runner*. In this film, there is again a smorgasbord of cultures, with everyday conversation mashing up a mixture of all languages.



As K makes his way up the eighty flights of stairs to his apartment, we discover how harshly he is treated by humans. Neighbors turn their backs to him, throw him dirty looks, and insult him. When he finally arrives home, he is welcomed by hateful graffiti. "Replicants in 2049 are a disposable workforce created to do the jobs humans would rather not do," explains Ryan Gosling. "Blade Runners live on the fringe, considered inhumane pariahs even amongst other Replicants. They are the lowest of the low: killers of their own kind. They are asked to murder without question or risk retirement should they show any sign of emotional distress from the brutality of their existence. K's apartment is a reflection of how cold and barren his life is."

THIS PAGE: The staircase was filmed in a Budapest school with hundreds of handpicked extras. The VFX team created set extensions to add height and a sense of vertigo to the shot.

K'S APARTMENT

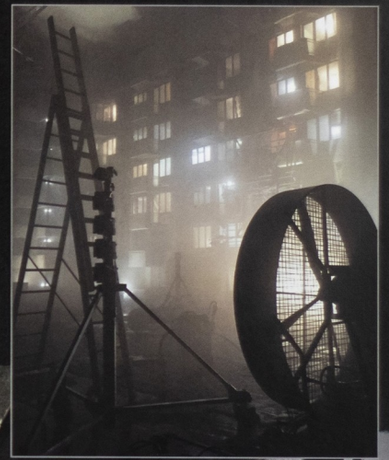
When K arrives home, he turns on the music to drown out the world. His apartment is small and dismal, but it's his safe haven. There is very little clutter, because Blade Runners live spartan lives. "He's got a government job with government housing," says production designer Dennis Gassner. "The typical apartment would be cookie-cutter. Everybody has the same layout. That's how we designed it." Except for the living room table and chair, all other furniture is embedded in the walls: the couch, shelves, even a retractable bed. The few objects in K's bachelor pad offer little insight into his inner mindset. He lives by his daily rituals. He takes a shower, pours himself a drink, lights up a cigarette, and eats dinner. All in good company.

TOP RIGHT: Among his few belongings is a worn copy of the 1962 novel *Pale Fire* by Vladimir Nabokov, the source material for his Baseline test.

RIGHT: With a food shortage in the world, humans and Replicants survive on pre-packaged meals made with bio-engineered protein. The design of the packaging is beautiful, a way of counterbalancing the bland taste of processed food.

RIGHT: The view from K's apartment window is a building built as a practical backdrop, with balconies, functioning lights, and curtains in the windows. The two-story high structure created the forced perspective of a housing tower on the other side of the street. "We built the facade at half scale," says supervising art director Paul Inglis. "We were shooting on that set for two weeks, and we wanted a real sense of the life outside." To create the appropriate atmosphere, constant mist was pumped into the studio. "We did it with a high-pressure system of water," recalls SFX supervisor Gerd Nefzer. "That sounds very simple, but it was tricky to get right."

BELOW: The concept art for K's kitchen reflects the style of Deckard's apartment in the first movie, including the Frank Lloyd Wright wall tiles. While building the set, Villeneuve insisted on having only a very small passage between the walls to create a sense of claustrophobia. "This room is very much an ode to Syd Mead," says Paul Inglis. "It's a tight space completely encrusted with gadgetry."

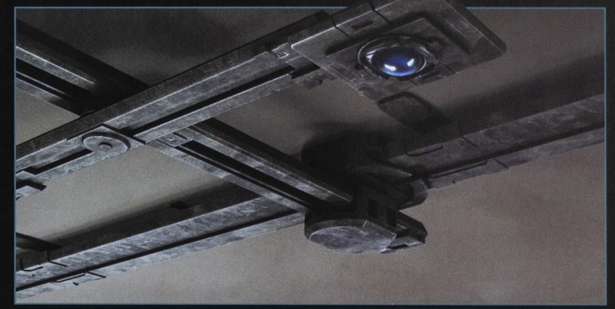


>>> "SHE KNOWS WHAT SOCIETY EXPECTS OF HER, AND SHE KNOWS THAT SHE CAN OFFER MORE."

—ANA DE ARMAS, ACTOR PORTRAYING JOI

JOI

The most innovative technology introduced in *Blade Runner 2049* are called DiJis. Designed by Wallace Corporation, these Digital Companions cater to humans and Replicants seeking solace in a world of such brutality and solitude. DiJis can be customized to suit all tastes, needs, and desires. Although they are mostly sold as sex toys, K has programmed his DiJi to create a sense of normalcy in his life. Her name is Joi, and she makes him feel like he's walking into a cozy home. "Joi is a companion of the future," explains actor Ana de Armas about her character. "She is designed to please everyone's fantasy, and K is asking her to be rational, autonomous, but also emotional. He wants her to be a real human, because that's what he needs. It's a constant battle for her. She is learning as quickly as possible, how to be like a real girl. But she's not." Her advanced artificial intelligence is designed to anticipate needs and evolve according to them. By wanting Joi to be real, K is challenging the technology to form its own opinions and have a mind of its own, which propels Joi into a completely different dimension.



ABOVE: A hardline emanating device is fixed to the ceiling, allowing Joi to appear inside the apartment within the range of the mechanical arm. The system is connected to a central console mounted on the wall, which controls everything from the radio to these Digital Companions.

RIGHT: Early VFX explorations of the transparency effect on Joi, offering a spectrum of possibilities to create this new type of *Blade Runner* hologram. In this world, a new form of technology creates these 3D images with perfect resolution and density. And contrary to present-day technology, these visual entities are emanated instead of projected. "Early on, we looked at holograms in movies, and for the most part we didn't like them," recalls John Nelson. "Denis and Roger didn't want a typical CG effect. We wanted it to have light fall on Joi, rather than her being made of light."

The relationship between Joi and K is a complex one. Pretending to be an old-school couple is poetic, romantic, but also a little unusual in this world. "The beautiful and crazy thing about this relationship is that they know it's not real, but they agree to play this game of having a normal life," explains Ana de Armas. "It's our little paradise. For K, going home is what gives sense to his existence."

This poses a question: How can a Replicant experience such complex emotions if he has no soul? "Joi was created solely for entertainment purposes," explains Ryan Gosling. "However, because of the harsh and alienated nature of K's life, she serves a more specific and unique function. Joi is a confidante and a confessor, someone he can share his moral conflict with. Revealing his need for connection and meaning signals that there is something unique about K."

The first *Blade Runner* explored the notion of what makes us human. This film takes it one step further, questioning the nature of technology and the possible awakening when artificial intelligence gains sentience and autonomy. "Through Joi's attachment for K, her love for him becomes real as opposed to programmed," says Hampton Fancher. "She escapes her own digital limitations and becomes real for herself."

Villeneuve had a specific vision for how he wanted Joi's hologram to look. It was something new; like nothing seen on-screen before, which also meant that no one knew how to capture it. The VFX team therefore devised a new technique that they tested and brought to set, knowing that they would develop it further with visual effects during post-production. "Everything about the role was challenging. First, there was no reference for Joi in the first film. She is new; she is the future. And since a part of my transformation was happening in post-production, I felt incomplete – doing the part without knowing what I was going to look like in the end."

The goal wasn't to create dazzling holographic effects. Quite the opposite. For the audience to feel a true connection between the two characters, it had to feel organic and real. Instead of traditionally shooting Ana de Armas separately and digitally placing her within Ryan's scenes, she and Ryan filmed all their scenes together. "We filmed Ana on set, so she wouldn't be computer-generated," explains John Nelson. "Then we tracked her performance with three other cameras on set to capture visual references of her from all angles. That allowed us to create what we call a 'back shell.' This technique adds an outline to Joi's volume, which is subtly visible through the transparency of her hologram."

ABOVE: As an empathy companion, Joi can change her look, ethnicity, and mood in a heartbeat to adapt to her owner's desire. "She had to be warm, sensitive, funny, sexy; someone you want to share your secrets with," explains Ana de Armas. "Our goal was to get the audience to forget the obvious fact that she's not real."

BELOW: An early VFX test of Joi "rolodexing," her ability to scroll through different looks and outfits in seconds.

ABOVE: A lot of thought went into designing the Emanator. Prop master Doug Harlocker recounts how Villeneuve wanted a beautifully sleek object that lit up when Joi was activated. Yet it also had to be durable enough to follow K throughout his journey. "We added a little bit of industrial design, because we were treating the Emanator as though it was a commercial product that you could buy at the electronics store, like a new remote control. Denis also wanted it to be small enough to fit in a pocket, so that pushed us toward almost a pen case-sized object."

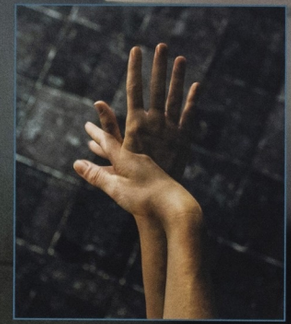
RIGHT: K gives Joi an Emanator, which allows her to project beyond the confines of the apartment. It gives her freedom, while offering K the opportunity to bring her comforting presence wherever he goes.

Denis Villeneuve's *Blade Runner 2049 Rule Book* contained a full chapter on DiJis. It explains how Digital Companions interact with the world, ranging from how they react to climate to how they merge with humans. Since Joi can't touch corporeal objects or people, the only way to have physical contact with K is to merge with a host body. To do so, Joi calls on a Doxie from the street market. "Mariette has this strange out-of-body experience when Joi hires her as a sex surrogate," explains Mackenzie Davis. "As a hologram, she can superimpose herself upon Mariette to have an actual sexual relationship with K."

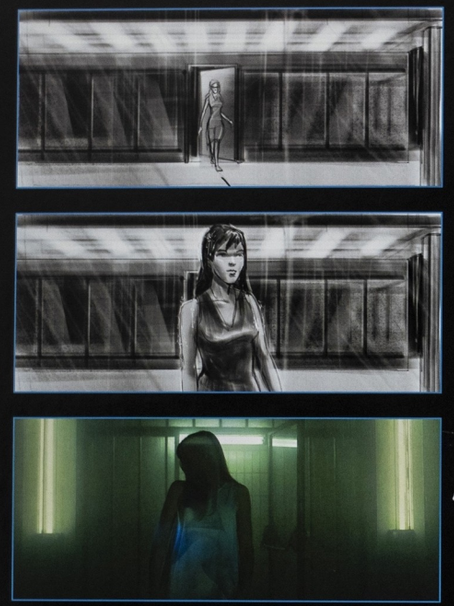
"It's like a beautiful love scene of unconditional love," says Ana de Armas. "Visually, it's beautiful and intriguing. Sometimes my image is predominant, sometimes it's Mariette, and for K, it's weird because at times he doesn't know who he is kissing." This merging effect was technically challenging to achieve, but the results blew everyone away. "When we were filming the scene, there was an amazing moment when not only did the two women merge, but they became a third person," recalls Ryan Gosling. "It was pretty haunting, and it felt really unique."

This was yet another unconventional challenge for the VFX crew, with no roadmap to lead them to the desired end result. Despite research and development done prior to filming, some elements had to be worked out on the spot. "A movie is a living organism," says Villeneuve. "It grows and transforms as you are filming it. There are things you can't predict. People kept asking me, 'What will the merge look like?' I knew what it could be, but it only became clear once we began filming. When we superimposed Ana and Mackenzie and discovered the face of a third woman, it reinforced my vision. It convinced everyone to go in that direction."

THIS PAGE: The actors were shot in a real environment, complicating the superimposition of the two actresses. They had to execute the exact same gestures following the same rhythm, like a dance. Watching video feeds on mobile tablets as reference, the actors aligned themselves to match their position from the previous take and followed the script supervisor's instructions as she called out the choreography to match the timing.



Filming these scenes was a lengthy process. Each segment had to be repeated several times by the two alternating actresses, as Ryan stayed still in the same position for hours. "It was beautiful, seeing the actors so committed to making the scene work," recalls Denis Villeneuve. "It was very difficult for our actresses, but also for Ryan. I deeply love when you feel actors trusting you. It's one of the scenes I'm most proud of in the movie."



ROOFTOP

The journey through Moebius Apartments finally leads us up to the rooftop. The design of this practical set built on a stage integrated elements from all four previous scenes, which in this case, were shot in completely different locations: the streets of Budapest, the Vas School lobby and staircase, as well as K's apartment in studio. "You want the audience to be taken through the front door and the lobby, up the stairs, into the apartment, and out onto the roof without ever feeling like they left one continuous space," explains Paul Inglis.

With this goal in mind, Dennis Gassner's Art Department built a physical rendition of the Los Angeles cityscape to add depth and realism in the background. "Where a lot of other films might have used green screens, we opted to create a tangible environment. We actually had third-scale representations of the neighboring buildings and referenced Soviet brutalism of the architecture of the actual location where we shot in Budapest."

RAIN INTERACTING WITH HER HAND

LEFT: According to the *Rule Book*, DJIs maintain a sense of realism by adapting their appearance to their environment in real-time, even changing weather conditions. As seen here, Joi's program takes a moment to process the information before making the proper changes to her appearance. Funny enough, the crew had a harder time adapting to the working conditions on set. "The water was heated, so that Ana de Armas wouldn't be cold. It was like working in a sauna bath for 12-14 hours a day," recalls John Nelson.

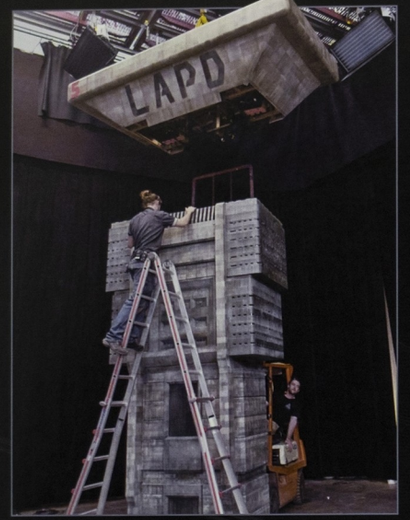
ABOVE: The impressive rooftop included giant video screens and overhead lights that moved across the studio ceiling, simulating Spinners flying in the night sky.

BELOW: The aerial view of the stage highlights the scale of the rooftop as well as the surrounding background buildings. The Moebius Apartment neon sign was built to scale and fully functional, but it was an artistic decision to feature it only from K and Joi's point of view. "Although you barely see the whole set in the movie, everything was so detailed," says Camille Verhaeghe. "That rooftop represented the futuristic brutalism of the world that Denis tried to create for the film." At the far end is a Soviet-type tower. Right next to it, a smaller scale replica of the building seen from K's apartment window.

6

LAW AND DISORDER
THE LA POLICE DEPARTMENT

The LAPD is an austere building, crowned by a large aircraft carrier-type landing pad with vertical parking portals going down like dark wells. Denis Villeneuve had a specific vision for this tower, which establishes the domineering undertone associated with law enforcement in 2049. "I wanted it to be far removed from our contemporary buildings and instead be a projection of the future." Entering the District 5 Police Department is a jarring experience. We discover the harsh reality not only of criminals, but also of police officers and Blade Runners.



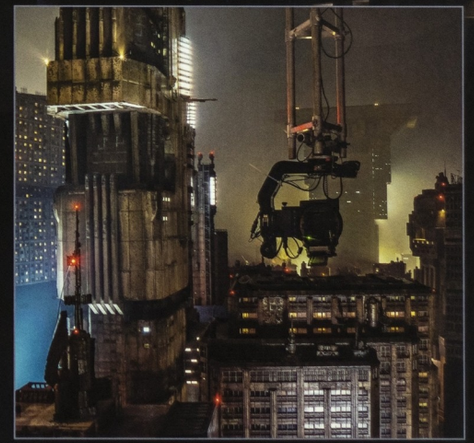
THE LAPD BUILDING

The Los Angeles Police Department is a pillar of society in this world, and Denis Villeneuve wanted a strong totalitarian-looking building to reflect that. "The tower's mushroom shape came right at the beginning. It's the first thing I designed and it didn't change. I wanted a brutal structure that looked down upon civilians. I was obsessed with this building shape."

In *Blade Runner 2049*, resources are spread thin. There are no available funds to invest in social structures, so the LAPD tower is in fact an old prefabricated building. "Denis had a very specific feeling of what he wanted," says Sam Hudecki on the conceptual design process. "We just chiseled away at it until we got to the final result."

This was Weta Workshop's largest and most elaborate miniature build on the film. The LAPD is the crown jewel amongst numerous surrounding buildings of the cityscape. "When you watch the scene with the Spinner flying to the LAPD, you're looking at a forced perspective," explains Weta's Alex Funke. "The buildings closest to camera were constructed at 1/48th scale, the ones further away were at 1/60th scale and even 1/72nd scale." Lighting and smoke were later added to make the structures appear like dark, massive silhouettes.

THIS SPREAD: In the original *Blade Runner*, miniatures were shot on film. Thirty-five years later, the process has gone digital. For this movie, Weta Workshop used still cameras equipped with cinema optical lenses. Once secured on a rig, the camera passed very slowly through the small-scale buildings, capturing the precise exposure required for the shot. "The principle of motion control is the ability to move the rig very accurately in a three-dimensional space," explains Alex Funke. "It's like watching paint dry."



THIS SPREAD: Early concept art explorations of the LAPD parking garage. Accessed through the circular entrance portals in the roof of the building, this voluminous space extends deep down into the building.

TOP RIGHT: Concept art of the LAPD Spinner.

Tensions run high at the LAPD. In 2049, law enforcement is insufficiently funded and on the brink of implosion. "Police forces are overwhelmed," explains Denis Villeneuve. "The building is in decrepitude and the hallway expresses that. The idea behind the design was an old spaceship where people have been vomiting and peeing for the past 30 years."

Blade Runners report at this station and work alongside human police officers, who treat them as mere "skin jobs" without souls. "It's a chaotic environment," says Dennis Gassner on designing the set. "It's a public space with lots of people from all walks of life. At the end of the night, the only way to clean it is to use a pressure hose on the walls and floors."

To reflect the scale of the building, a 160-foot hallway was built with ridged rubber floors and water-resistant walls, which were hosed down during a scene.

LEFT: This concept art reflects Denis Villeneuve's vision of the LAPD hallway, as originally drawn in the storyboards by Sam Hudecki. "The peeing man was a quirky idea that came along early in the process and it stuck." The scene was even shot with an extra using a peeing gag, created by the SFX team.

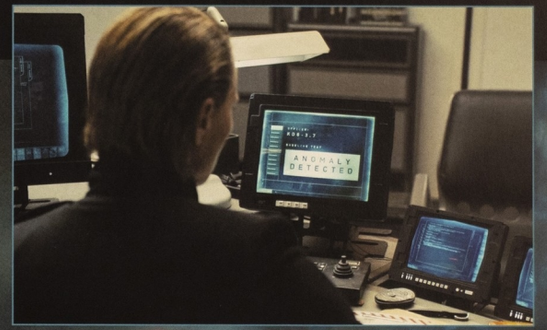
RIGHT: Following the creative process from A to Z. At the top, concept drawings by Sam Hudecki. In the middle, precise construction instructions given by Villeneuve and Deakins to Dennis Gassner's Production Design team. At the bottom, the final results with dozens of extras on set.

"THERE IS AN
>>>ORDER
TO THINGS."
–LIEUTENANT JOSHI

JOSHI

Portrayed by Robin Wright, Lieutenant Joshi is a complex character; commanding yet compassionate at times. "Joshi is technically K's boss, but really she has an ownership over him," explains Ryan Gosling. "His life depends on whether she's satisfied with his work, and he feels submissive and subordinate."

Principal photography began on July 11th, 2016 on this set. "We started shooting the bright interiors to voluntarily create distance with the film noir aestheticism of the first movie," recalls Villeneuve. "We filmed bright Hong Kong-type interiors with harsh neon lights. Brutal. Yet Roger still created insane beauty with that kind of lighting."



THIS PAGE: The concept art inspired by Sam Hudecki's early storyboards established the vision for Joshi's office, which was later built as a completely functional office. "My theory on any space is that you start with the foundation," says Dennis Gassner. "For Joshi's office, it was the desk. This is her command post, a highly technical piece of art as well as a piece of technology." From here, Joshi can monitor Blade Runners, such as K's brainwave patterns as he undergoes his Baseline test.

THIS SPREAD: The outer walls of the LAPD building were built as a practical set in order to film a scene looking into Joshi's office from an exterior point of view.

RIGHT: The crew constructed lit cut-outs and painted backings to simulate the Los Angeles skyline seen from Joshi's office. Snow, rain, and misting machines completed the effect.

MORGUE

In the same lighting scheme as Joshi's office, Denis Villeneuve and Roger Deakins introduce the morgue. Here, we encounter a forensics technician named Coco, patiently analyzing evidence for Joshi and K. "I immediately sensed from the script that Coco respects K," says David Dastmalchian, the actor portraying Coco. "When Ryan Gosling walked into the room in character, I instantly felt like he was a living and breathing embodiment of somebody that, if I peeled his skin back, was not human underneath."

Wood Harris portrays Detective Nandez in this scene. "I would classify my character as a bit of a jerk. Since K doesn't have a soul, my character treats him like he's Siri on my phone. You don't care what you say to Siri or how you treat Siri. It's just technology."

ABOVE: Two morticians vacuum seal a body bag created by prop master Doug Harlocker. "We made the body bag in a reflective white plastic and added custom-made graphics. Then Special Effects did the shrink wrap effect by zipping it up and sucking all the air out, with an actor inside."

LEFT: The Prop Department used a real skull as reference to build a full skeleton and paint it to look like it had been buried for 30 years. Harlocker asked the director if he wanted the skull to have teeth. Villeneuve answered: "No teeth is more romantic." To which, the prop master answered: "I prefer teeth personally." In the end, the skull was romantically toothless.

ABOVE: The Denabase can sift through millions of DNA files. Yet this old system sometimes fails and the only way to retrieve information is to run the codes raw. Only Replicants can process the high-speed flickering files. In this scene, Joi appears at K's command. Without syncing with him, she is able to peer over his shoulder, and even through him, to observe his research.

DENABASE

For director Denis Villeneuve, objects and machines have to make sense in a movie. Everything down to the smallest details must have a clear purpose and not just be pretty. This piece of equipment is a perfect example of that.

The Denabase (pronounced Dee-na-base) is a large EMP-proof analog database used by police forces to catalog hard copies of DNA files. In the script, the machine is described as an old moviola, an ancient and clunky editing system. That was the starting point for Doug Harlocker, who developed a unique and enigmatic machine. "We just played around with odd shapes and came up with that design. I love that piece, because it's bigger, complicated, and everything is made from scratch. For example, the keyboards are not typical landscape rectangles, but portrait shapes. And Ryan had dials and elements to operate on the machine. It was really interactive and fun."

RIGHT: The concept art and unit photography here illustrates the careful detailing of the Denabase, right down to the shape of the keyboard keys.

THE BASELINE TEST

In the original *Blade Runner*, the Voight-Kampff method was used to distinguish Replicants from humans. In this film, a more advanced technology analyzes a Replicant's operational stability. "The Baseline is designed to test the effects of a Blade Runner's job on his brain and psyche," explains Ryan Gosling. "Because they have to kill their own kind, they constantly need to be assessed as to whether their work is having some kind of moral impact on them."

Two versions of the Baseline scene were filmed for the movie: the original scripted version, and a much longer take written by Ryan Gosling himself. It was a lengthy eight-minute staccato dialogue, and Gosling delivered each take without hesitation for every camera angle.

The moment it was filmed, everyone on set felt that they had witnessed something unique and powerful. "When you start shooting a movie, there's always a scene that makes you feel you've made contact with the soul of the story," recalls Villeneuve. "This was it, and it became our own Baseline for the rest of principal photography."

This feeling was shared by Joe Walker in editorial. "It was one of those great times as an editor, where you lift off from the page and it's no longer about scripted material, but there is blood running through the veins of an idea." The long scene was later fine-tuned to serve its percussive purpose in the final cut. "It's an attack on K's psyche, so it has to wrong foot him and be hellishly aggressive. That gave me a lot of material to work with rhythmically in the cut."

THIS PAGE: The Baseline scene was shot on a small set with fly-away walls, allowing Roger Deakins to film Ryan Gosling from all angles. Mark Arnold, the actor portraying the Interviewer, was sitting in the morgue a few feet away delivering his lines with a microphone. His voice was transmitted via speakers within the Interview room, just like a real Baseline would be administered.

A blood black nothingness began to spin.

Began to spin.

Let's move on to system. System.

Feel that in your body. The system.

What does it feel like to be part of the system. System.

Is there anything in your body that wants to resist the system? System.

Do you get pleasure out of being a part of the system? System.

Have they created you to be a part of the system? System.

Is there security in being a part of the system? System.

Is there a sound that comes with the system? System.

We're going to go on. Cells.

They were all put together one at a time. Cells.

Millions and billions of them. Cells.

Were you ever arrested? Cells.

Did you spend much time in the cell? Cells.

Have you ever been in an institution? Cells.

Do they keep you in a cell? Cells.

When you're not performing your duties do they keep you in a little box? Cells.

Interlinked.

What's it like to hold the hand of someone you love? Interlinked.

Do they teach you how to feel finger to finger? Interlinked.

Do you long for having your heart interlinked? Interlinked.

Do you dream about being interlinked?

Have they left a place for you where you can dream? Interlinked.

What's it like to hold your child in your arms? Interlinked.

What's it like to play with your dog? Interlinked.

Do you feel that there's a part of you that's missing? Interlinked.

Do you like to connect to things? Interlinked.

What happens when that linkage is broken? Interlinked.

Have they let you feel heartbreak? Interlinked.

Within cells interlinked.

Did you buy a present for the person you love? Within cells interlinked.

Why don't you say that three times? Within cells interlinked.

Where do you go to when you go within? Within.

Has anyone ever locked you out of a room? Within.

Within.

Where do you go to when you go within? Within.

Where is the place in the world you feel the safest? Within.

Do you have a heart? Within.

Stem.

Did you pick asparagus stems?

What comes from something else? Stem.

Have you been to the source of a river? Stem.

When's the first time you gave a flower to a girl? Stem.

What did she look like? Stem.

Is it a slang word for people's legs? Stem.

Have you planted things in the ground? Stem.

Have you ever been in a legal battle? Stem.

Within one stem.

Dreadfully.

Is that an old fashioned word? Dreadfully.

Did you ever want to live in the nineteenth century? Dreadfully.

What's it like to be filled with dread? Dreadfully.

Have you ever wished you could be a real detective? Dreadfully.

Do you think you could find out all the answers to all the questions? Dreadfully.

Distinct.

How good are your eyes? Distinct.

Do you have a particular personality? Distinct.

Do you like being separated from other people? Distinct.

Do you like blending in with things? Distinct.

What separates somebody from somebody else? Distinct.

Who do you admire most in the world? Distinct.

What was your most shameful moment? Distinct.

Dreadfully distinct.

Dark.

Were you afraid of the dark whan you were little? Dark.

What's it like to hide under a bed? Dark.

Did they keep you in a drawer when they were building you? Dark.

Was it dark in there? Dark.

Do you have dark thoughts? Dark?

Did they program you to have dark thoughts? Dark?

Do you think it's some kind of corruption these dark thoughts? Dark.

Were you supposed to be happy and happy and you chase? Dark.

Maybe it's a spot of [illegible] something? Dark.

Who's the darkest person you know? Dark.

What is it like when someone gives you the silent treatment. Dark.

Who did you get your darkness from? Dark.

Against the dark.

What kind of power do you have against the dark. Against the dark.

Do you think there is such a thing as evil? Against the dark.

Do you think you can protect people against the dark. Against the dark.

Why are these things happening? Against the dark.

Do you prefer the day or the night? Against the dark.

When is the last time you saw a starry sky? Against the dark.

What's your favorite part of the moon? Against the dark.

Fountain.

Have you seen the Trevi fountain in Rome? Fountain.

Have you seen the fountain in Lincoln Center? Fountain.

Have you seen fountains out in the wild? Fountain.

What's like when you have an orgasm? Fountain.

Have you read the Fountainhead? Fountain.

White fountain.

Is it put white? White fountain.

Is that [illegible] hor? White fountain.

How do the white fountain make you feel? White fountain.

Have you ever played in a white fountain? White fountain.

A tall white fountain played.

Have you ever seen all those musical fountains with all the colored lights?

A tall white fountain played.

When you were little did you ever fall into a fountain?

A tall white fountain played.

Do you like earth, air or water?

A tall white fountain played.

Do you [illegible] ping around in the water?

A tall white fountain played.

A blood nothingness.

A system cells.

Interlinked.

Within interlinked.

Within interlinked.

Within stem.

And dreadfully distinct.

Against dark.

A tall fountain played.

LEFT: The unabridged alternate Baseline script written and delivered by Ryan Gosling.

On July 14th, Day 4 of principal photography, Ryan Gosling delivered an alternate Baseline script that lasted eight minutes. On this page, the actor explains his process in achieving such a hypnotic performance:

"The Baseline was always a scene to me that held the key to understanding K. I wasn't sure what that key was during the preparation period of the film. In the script, the character was meant to read a small passage from Nabokov's *Pale Fire*, but there wasn't any insight as to why.

In order to better understand the meaning of the passage and to give it a personal meaning, I enlisted the help of a wonderful vocal coach named Natsuko Ohama. She suggested a technique called "Dropping In." In this technique, you explore the meaning of each word of the text by exhausting every conceivable context in which the word could be used.

The process is very long and repetitive, but it has a trance-inducing effect that can be very powerful and unsettling. I felt that if that technique were extrapolated into K's experience, it could be used to penetrate his psyche. I believed we could learn through a process of psychological erosion what his true emotional state was.

I was very grateful to Denis for incorporating it into the film, because it unlocked my understanding of K, but also provided insight into the state of mind of those who would force this burden upon him."

BLIND AMBITION
THE WALLACE CORPORATION

In 2049, as humans and Replicants co-exist in a world on the brink of extinction, one man is responsible for the survival of the former and the fabrication of the latter. As a result of his fierce ambition, Niander Wallace has become the richest and most powerful man on Earth, surpassing the Tyrell Corporation both in size and accomplishments. "Wallace is a cross between Steve Jobs and Genghis Khan," says Denis Villeneuve. "I envisioned him having striking magnetism, with a bit of madness. A character larger than life."

Everything at Wallace Corporation expresses excellence, ambition, and prosperity. "The scale of the architecture reflects the scale of his power," says Dennis Gassner.

WALLACE TOWERS

Three monumental buildings rise above the Los Angeles skyline, towering insolently over the Tyrell buildings. Welcome to the Headquarters of the Wallace Corporation, a company known worldwide for its technological breakthroughs. From bio-engineering a new protein source now feeding the world to manufacturing the Replicants and Digital Companions driving society's economy, the Wallace Corporation has impacted all corners of commerce and all walks of life.

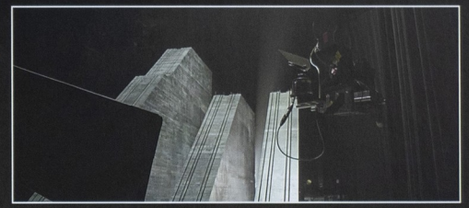
Designing the Wallace Headquarters required a year of research and development. The challenge was determining what kind of edifice would convincingly overshadow the iconic Tyrell ziggurats. An early concept consisted of having three angled towers forming the letter W, but Denis Villeneuve wanted a more subtle and mysterious presence in the cityscape. One that would command respect and stand as a constant reminder of Wallace's superiority and power.

In the end, the building was ambitiously designed as sea blades, three epic superstructures built to withstand the next 10,000 years by cutting through ever-rising water levels. Even if the seas rose high enough to wipe Los Angeles off the map, the Wallace Corporation would stand tall and endure.

Once the concept art (featured on this page) was approved, it was sent to Weta Workshop to be constructed and shot as a miniature. "We built the Wallace Towers at 1/600th scale, and it was four meters tall even then," explains Alex Funke. "We constructed it that size because it was manageable as far as surface detailing, using various tools to create the texture." The Wallace Towers were filmed in New Zealand (see insets) and later rendered in VFX to add surrounding buildings, Spinners, atmosphere, snow, and rain.

LEFT: Early concept art of the Wallace Headquarters, whose three towers were designed to resemble a W from certain perspectives.

storyboard frame



THIS PAGE: These behind-the-scenes pictures from Weta Workshop offer a glimpse into the Wallace Towers filmmaking process with miniatures, or rather "bigatures" as they call them, since there is nothing small about them. The crew diligently worked to get the perfect color and texture to match the overall palette of the city. They also followed specific instructions from Roger Deakins in terms of atmosphere, lighting, as well as the speed and angle of camera movements. Every detail had to be spot on to make the 4-meter-high wood constructions look like the majestic and intimidating Wallace Towers on-screen.

In contrast with its somber facade, the interior of the Wallace Towers is luminous and palatial. Conceptualized during the storyboarding process, the architecture reflects the megalomaniac persona of Niander Wallace. With his unlimited riches, this character has built himself an environment in which he has surrounded himself with all the resources otherwise unavailable in the outside world, such as abundant space, water, technology, even wood. Despite the absence of windows, simulated sunlight shines into every room. "More than any particular architectural style, our principal inspiration for this building was light," recalls Paul Inglis. "Outside the sun is always shrouded in hazy smog, but within Wallace's world shafts of sunlight move artificially upon plain, bold surfaces." The Records Library seen here was too large to build full scale. The actors were first filmed on set and later composited into the computer-generated environment.

LEFT: The VFX render of the Records Library.

RIGHT: Early concept art of the Records Library, designed with an angled roof. Below, full-scale cabinets were built on set and individually labeled. Only one of them opened as a functional drawer.

BELOW: A ceiling camera offers a bird's eye view of the grips setting up the lighting while cast and crew stand by, ready to film the scene.

All documents relating to existing and retired Replicants are archived in the never-ending rows of cabinets in the Records Library. On this set, Dennis Gassner's team physically built one hundred 12-foot tall cabinets, with each drawer labeled by hand. Beyond the expansive construction on stage, set extensions were added in post-production to reflect Wallace's immense body of work. In the final render, it is impossible to see where the set ends and where VFX begin as K walks through the Library alongside the File Clerk played by Thomas Lemarquis.

For Dennis Gassner, each environment has to tell a story. This setting feeds Wallace's character, as well as his ego. "It's in complete opposition to K's apartment, which is a more confined environment. That creates an accordion and gives the movie rhythm," says Camille Verhaeghe on the Art Department's philosophy.

>>>"NIANDER WALLACE IS LIKE ELON MUSK, IF ELON WASN'T SUCH AN UNDERACHIEVER."

–JARED LETO, ACTOR PORTRAYING NIANDER WALLACE

NIANDER WALLACE

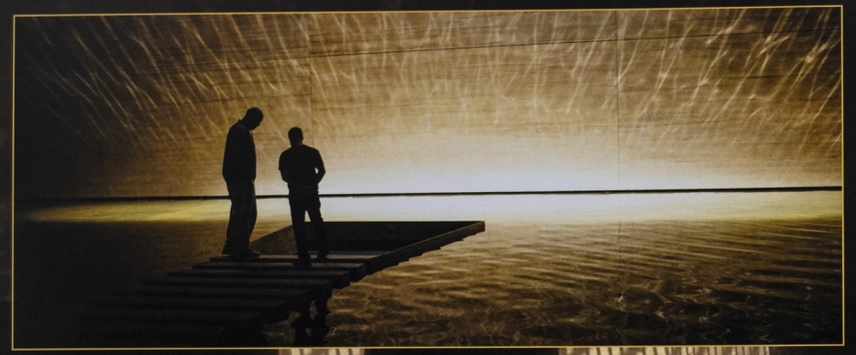
Niander Wallace is not only a visionary businessman and the world's only trillionaire, he is also responsible for saving the planet from starvation. To portray this quintessential character, Denis Villeneuve reached out to David Bowie in January 2016, only to learn of his passing days later. "After that, I felt like David Bowie became my muse for this role, and I had to find someone with the same magnetism. I had to find a rock star."

Conveniently enough, Jared Leto had been knocking on Alcon's door since 2014 to play a role in the *Blade Runner* sequel. "A few weeks after he won his Academy Award for *Dallas Buyers Club*, he came to ask us for a part, any part," recalls producer and Alcon co-CEO Broderick Johnson. "He was a huge fan of the original film." In September 2016, Jared Leto walked on set portraying Wallace. "To me, Niander is someone who willed himself to power through hard work and rigorous study. He's a genius, but a bit of a madman trying to save humanity."

Makeup designer Donald Mowat had custom-made lenses prepared in Los Angeles for Leto. "The eye specialist hand-painted two pairs of lenses to look like visually impaired eyes and came up with something we've never seen before." The blue light on the actor's neck is the activated Halo device, a groundbreaking technology that allows Wallace to see using his mind's eye with the assistance of drones.

In an early version of the script, Niander Wallace was described as having no eyes, only eye sockets – a rare condition caused by a congenital disease. For cinematic purposes, Denis Villeneuve made him blind instead. Leto embraced the challenge. "To get into the role, the most impactful thing I did was spending weeks with a young, blind man named Chris and immersing myself into what it's like to live without sight," explains Leto. "Though Niander is more brutal and Machiavellian, there are many elements of Chris in the character."

As a dutiful method actor, Jared requested opaque contact lenses so that he could experience being blind on set. He stayed in character from morning to night. "It was tricky, but it created such tension on set," recalls Denis Villeneuve. "It was very powerful to watch him act. And to play Niander Wallace is very tough, because he must deal with an insane amount of dialogue. What can I say? I chose a rock star, and he blew us away." When screenwriter Michael Green saw Jared Leto as Wallace, the role took on its full meaning. "Suddenly it became obvious that a blind person could have a clearer vision of the future than a person with sight."



"Wallace's office was one of the largest sets we built," explains executive producer Bill Carraro. "We created a practical set within three feet of water in a koi pond. The walls took a life of their own with caustics, as light reflected upon the water."

How do you design a space for a blind character? "It comes down to scale," says Camille Verhaeghe. "Wallace can't see, but he can hear. The power of his voice fills this massive space."

Jared Leto considered it a gift to be in these cavernous, cathedral-like spaces. "My voice would reverberate off the walls and it made the character feel empowered. And every once in a while, I could see just a little bit of light as it would float through the space. It was hypnotic."

In fact, Roger Deakins used a circular apparatus with 286 incandescent lights tracing around like an artificial sun. In a world without sunlight, Wallace is wealthy enough to make his own.

"ROGER DEAKINS PAINTS WITH >>> LIGHT."

–JARED LETO, ACTOR PORTRAYING NIANDER WALLACE

Roger Deakins is known as a master of light, but even he admits that this film challenged him more than any other in his career. "I've only done one film of this scope that offered such an opportunity to play with light, and that was *Skyfall*. So I thought, go for it."

Jared Leto was a witness to the director of photography's rigorous work ethic. "I love Roger, because he's so immersed in his work in the same way that I'm immersed in mine. I came to set one weekend to get familiar with Wallace's environment and I saw him there, when everyone else had the day off. He was with his team setting up lights and working away quietly and incessantly." Roger Deakins recalls the complex shoot with a smirk. "Wallace's world is warm with lots of moving lights. It looked great on paper, but it was a nightmare. [LAUGHS]"

The entrance to Wallace's office is an architectural marvel. Guests enter from a flight of stairs beneath the pond, which opens to a wide mouth in the ceiling and blends seamlessly into the surrounding waters as it reaches the office. The result gives the illusion of visitors appearing from a vanishing point, as if walking directly out of the water and into the room. They must then walk on the flat stepping stones to reach Niander's zen-like office space. Crossing the pond required some agility. The slightest imbalance or misstep would send anyone nosediving into the water–a good defense system to prevent sudden attacks or unwelcome visitors.

>>> "IF YOU'RE NOT THE BEST AT WHAT YOU DO,
# WHO ARE YOU?
WHAT ARE WE HERE FOR THEN?"

–SYLVIA HOEKS, ACTOR PORTRAYING LUV

LUV

When Sylvia Hoeks auditioned for Luv, she read the part of Roy Batty asking Tyrell for more life. "I'm Dutch, Rutger Hauer is Dutch, and I thought, 'Well, why not have a Dutch Replicant in this movie?'"

Luv is Wallace's most ruthless soldier, but Sylvia Hoeks brings elegance, nuance, and complexity to the character. "One thing I deeply love about Luv, as a female actress, is not having to play a sexy woman, the housewife, the girlfriend. It's nice to have a female character who's a freak with the same power as a male character." "Luv is a black widow," says Hampton Fancher. "She's bad and inexorable. When she's on your tail, she will kill you. She cannot stop."

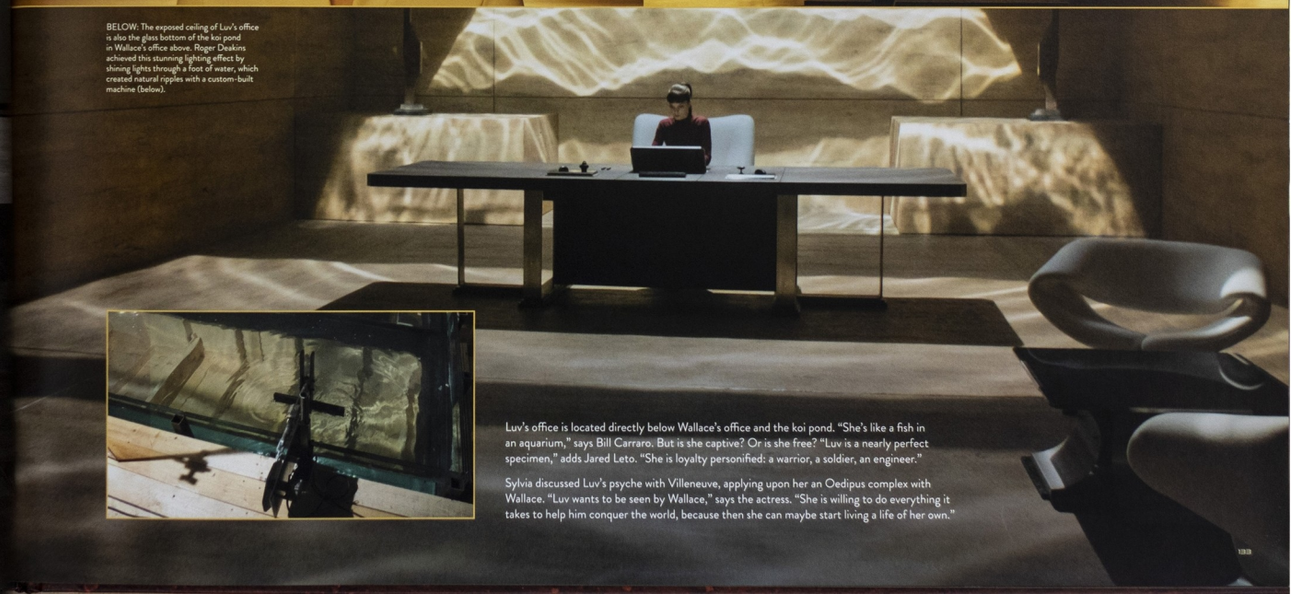
Women are more empowered in the future of *Blade Runner* according to Sylvia, yet her character is a Replicant and must abide by some rules. "Because Wallace made her, he can also break her. So she focuses on being everything he expects of her and more."

Her costume, which was designed by Renée April, reflects Luv's desire for perfection. "The lines are very pure and sleek, almost Japanese. I wanted to concentrate on Sylvia's extraordinary face. There's nothing that disturbs us from going there." Luv may look like a woman, yet she is actually only twelve years old emotionally. "Sometimes she acts like a little boy, sometimes like a little girl, sometimes like a woman," explains Hoeks. "There's no secret agenda. She acts on some sort of programming malfunction."

ABOVE: The nail tools, stand, and headgear were invented for this scene, as Luv commands an attack while getting a manicure.

"Luv is a weapon, but she is not an empty shell devoid of identity," says Sylvia Hoeks. "That's why she does what she's doing–to be important, to exist in the world." The actor found inspiration in today's powerful young women. "They're judged every day by their actions, the friends they have, and what they consume. Especially with social media. It's like their image is manufactured. I observed their choices and how the world is controlling them instead of them being in control." Above, the unique props designed for Luv give us insight into her character: stylish, pristine, precise, and deadly.

BELOW: The exposed ceiling of Luv's office is also the glass bottom of the koi pond in Wallace's office above. Roger Deakins achieved this stunning lighting effect by shining lights through a foot of water, which created natural ripples with a custom-built machine (below).



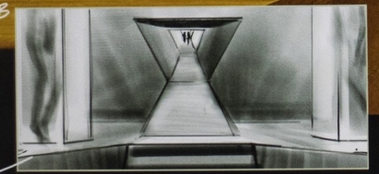
Luv's office is located directly below Wallace's office and the koi pond. "She's like a fish in an aquarium," says Bill Carraro. But is she captive? Or is she free? "Luv is a nearly perfect specimen," adds Jared Leto. "She is loyalty personified: a warrior, a soldier, an engineer."

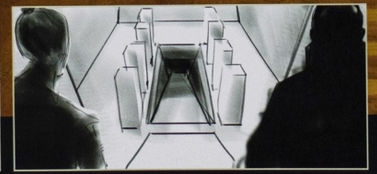
Sylvia discussed Luv's psyche with Villeneuve, applying upon her an Oedipus complex with Wallace. "Luv wants to be seen by Wallace," says the actress. "She is willing to do everything it takes to help him conquer the world, because then she can maybe start living a life of her own."

REVERSE ENGINEERING
THE REPLICANT CRAFT

Replicants are bio-engineered humans originally designed for hazardous labor in Off-World colonies. In the first *Blade Runner*, the Nexus 6 model was designed to be smarter, stronger, and faster than humans with a limited lifespan of four years. These models became illegal on Earth due to their dangerous behavior. Most were hunted down and retired by Blade Runners.

In 2049, Nexus 7 and Nexus 8 models still roam the Earth, but Replicant technology has evolved. The current generation is more advanced and refined than ever, yet certain models still show signs of imperfection and instability.





PUSHING BEHIND K
LUV AND K

ON LUV

NEXUS RELIQUARY

Niander Wallace purchased the Replicant patent from the Tyrell Corporation, and proudly displays the older prototypes as a symbol of his power and his contribution to the Nexus legacy.

With the goal of creating the spectacular lights and shadows effect, the Nexus Reliquary was built as a practical set with bodies in the tanks. "Once a week, we would scan two people at a scanning facility and then produce 3D prints of their bodies," explains prop master Doug Harlocker. The only element digitally added to the final scene is the water. "It was too structurally challenging to fill the tanks," says Bill Carraro. "They would've weighed 3,000 pounds each."

ABOVE: The Barracuda seen above is an advanced drone that feeds visual information into the Halo device implanted into Wallace's skull. It simulates a 3D version of sight within his mind's eye, allowing Wallace to inspect his latest creations.

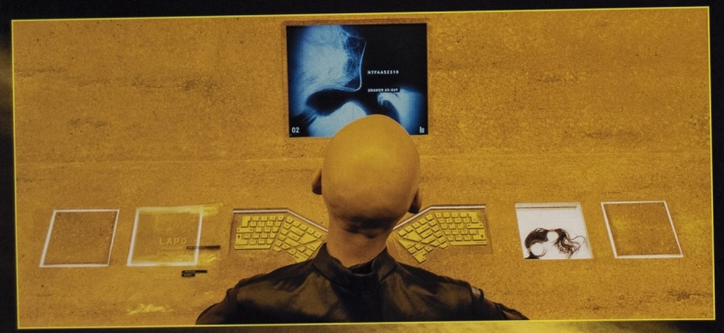
CRECHE

Wallace Corporation mass-produces Replicants and exports them to clients on Off-World colonies. The ultimate goal is not quantity, however. It's quality. In the Creche, Wallace examines the most recent prototype and will only be satisfied when he reaches perfection.

The birth of the Replicant was shot with practical effects developed by Gerd Nefzer and his team. It was a claustrophobic experience to watch actress Sallie Harmsen get vacuum sealed into the birth bag seen on page left, breathing through a tube under the supervision of stunt coordinator Joel Kramer. The bag was then lifted a few feet off the ground until the vacuum system was shut off. She then dropped to the ground and was again able to breathe freely.

RECORDS LIBRARY

In 2049, there is no such thing as digital data storage. Society has steered away from technology after the Blackout, when an electromagnetic pulse shut down all machines for ten days. Once electrical power had been restored, all data had vanished outright: pictures, files, even bank records. The common belief is that Replicants were behind the attack, conspiring to destroy their records in order to integrate into society as humans. Decades later, technology is widely considered unreliable by corporations and commoners alike. The Wallace Corporation has developed this analog library system to store their Replicant data, which they use to monitor and document active and Pre-Blackout models.

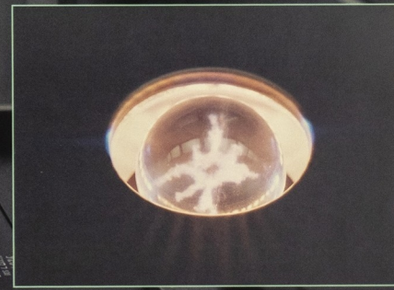


LEFT: This is the reception desk, where the File Clerk searches the analog filing system to locate documents within the Records Library. This computer scans Replicant fragments to identify its serial number.

MEMORY VAULT

In addition to the Records Library, Wallace stores highly classified Replicant documents in the Memory Vault. Any remnants of information pertaining to Pre-Blackout models are locked away in this refrigerated strong-room to prevent further deterioration of the old data units. Known as Memory Bearings, these glassy spheres are encrypted with video files, which can be viewed by placing the Bearings on a secure player device. Well preserved Memory Bearings are clear, whereas the cloudy ones indicate damage and potentially corrupted content.

LEFT: The elegant Memory Bearings were designed by prop master Doug Harlocker. "My initial thought was to have a hard, less organic shape in the center resembling a neuron or ganglia, and then add a cloud around it for the milky cataract ones."



BELOW: Reality meets Dr. Ana's virtual world as K enters the Memory Lab. "In a movie devoid of foliage, this is an unusual scene," says Ulrich Nelson. And yet inside the Memory Lab, Ana can virtually create any object or environment with ease.

ABOVE: This is the very first scene shot by first unit. It was July 1st, 2016. Day 1 of Pre-Shoot. Actor Carla Juri and the crew filmed footage in the forest that would later be made to look like a holographic environment within the Memory Lab. "This scene was originally scripted as the Costa Rican jungle," recalls location manager Emma Pill. "But ten minutes away from our studio in Hungary, there was an old orphanage called Föt with beautiful grounds covered in ivy. We were lucky, because there isn't much forest in Budapest."

MEMORY LAB

Memory engineering is a lucrative business in 2049 and Dr. Ana Stelline is one of many specialists who carefully crafts the individual memories implanted into Wallace's Replicants. "She gives them an identity and orientation," explains Carla Juri who portrays Dr. Stelline. "These memories make Replicants more docile, while also humanizing them."

For director Denis Villeneuve, this scene encompasses the main theme of the movie. "This story is about what defines us as human beings, it's more specifically about memory. Are we humans without our past? Can we evolve without memories? We can be slaves to memories, or be empowered by coming to terms with them. That's what the movie is about for me."

Ryan Gosling's character is a Replicant, and therefore has been implanted with custom-made memories. "These allow Replicants to have some kind of reference and simulate what it feels like to be human, so that they can interact with them and understand them." In an earlier version of the script, K recalls nearly drowning as a teenager, which as a result made him fear water. Was this a real memory or a fake one? K couldn't tell the difference, but Dr. Ana Stelline's analysis confirms that it was an implant. "Sometimes what you believe is true, isn't," says screenwriter Michael Green. "Your own expectations and fantasies crash against the hard reality. Those were the themes we were most fascinated with."

>>>"WE'RE ALL TRAPPED IN OUR OWN SUBJECTIVE UNIVERSE."

—CARLA JURI, ACTOR PORTRAYING ANA

DR. ANA STELLINE

Dr. Ana Stelline is a unique character isolated from the world, living behind glass in a sterile building overlooking the ocean and the Sea Wall. "She was put in this concrete egg when she was around eight," explains actor Carla Juri. "She had a life outside before, but then she got a very weak immune system. They put her in this isolation room, where she grew up unspoiled by society."

In this quiet and timeless room, Dr. Ana creates beautiful worlds to fill Replicants' minds. An act of kindness, according to Carla Juri's character. "She can relate to Replicants. She doesn't belong in the real world either, having been in isolation for such a long time."

For Hampton Fancher, empathy is a central theme to the *Blade Runner* universe. "When we really know what it's like to feel like somebody else, we won't want to do bad things to them. Empathy is a leading quest in our destiny, because that'll determine our success."

Dr. Ana's dream-like visions offer relief to Replicants from their hard existence, but they also serve as a diversion for her own solitude. "Imagination is an escape from her confinement," says Carla Juri. "It's a way of liberating herself and giving her a link to the outside world. To Humanity even."

LEFT: To achieve the appropriate light effect on Dr. Stelline, the crew built a Go-bo cake stand rig. What's a Go-bo? It means "goes before optics" or "graphical optical black out," and it's a device that produces sharp-edged shadows. In this case, the stand simulates the light and shadows cast by lit candles on a rotating and tilting birthday cake, which was added later by the VFX team.

LEFT: Director Denis Villeneuve looks on as the construction crew brings finishing touches to Ana's Lab. The large, wooden structure was built as a two-story and 360° set, painted in light gray to resemble concrete. The inspiration for the ovoid shape was the Darwin Center at the Natural History Museum in London.

RIGHT: The children at the birthday party scene were filmed with a five-camera array against a blue screen. This allowed Villeneuve to capture the action from five very close points of view.

What if you doubted the authenticity of your own memories and existence? That's how actor Carla Juri approached the role of Dr. Stelline. "They tell her she's human, yet she has no reference to the past due to her limited time in the outside world. Just as Replicants come to question their reality, she does as well."

It was both a creative and technological challenge to film the birthday party memory as it was scripted. After Denis Villeneuve storyboarded the scene with Roger Deakins and Sam Hudecki, the various departments developed a process to achieve their vision. The children were first filmed with a five-camera array. The multi-angled footage was then rendered in VFX to create the illusion that Dr. Stelline virtually rotates the children as she designs both them and the birthday cake they're all sitting around.

The scene was shot on the Memory Lab set, built as a functional room with fly-away walls that allowed the camera crew to film the scene while protecting the integrity of the peaceful environment. Juri recalls the impressive set and integrated lighting. "It was beautifully lit, but I couldn't actually see the lights. Just like the camera, it was always outside my space. That was new for me, because usually you're aware of it."

BELOW: Inspired by old analog cameras, the Memory Orb is a tool used to engineer memories. The prop was fully operational using several buttons that activated up to four rings moving concentrically at the same time, but at different speeds. On this page, Dr. Ana Stelline creates a birthday party and customizes the icing on the cake, the candles, and the children celebrating.

"MEMORIES ARE GIVEN TO REPLICANTS IN ORDER TO PROVIDE SOME CONTEXT TO THEIR LIVES. WITHOUT THEM, THERE WOULD BE A HUGE VOID."

—RYAN GOSLING, ACTOR PORTRAYING K

RIGHT: To inspect Replicant memories, Ana uses a machine called the Stelline Scan. Designing it turned out to be a challenge. "We had to cruise carefully between dangerous cartoon icebergs," says Denis Villeneuve on finding the appropriate sci-fi design for the *Blade Runner* universe.

THE OUTSKIRTS

Beyond city limits lay the forgotten outskirts that have been washed away by the ocean. "In 2049, Los Angeles spreads from San Francisco to San Diego," explains Denis Villeneuve. "The suburbs, unprotected by the Sepulveda Sea Wall, were flooded and destroyed. Over time, Los Angeles officials decided that this would be a prime location for the city's waste." This world is suffering and the outskirts hold the most visible scars.

TRASH MESA

Pursuing his investigation, K flies beyond the urban boundaries into the Trash Mesa, the last harbor for anything from humans to shipwrecks.

The mood is ghostly as he flies through the ship cemetery. To create this eerie and treacherous sea of trash, the creative team looked for inspiration in the Chittagong ship breaking yards in Bangladesh, photographed by *Manufacturing Landscape*'s Edward Burtynsky. "His pictures are stunning and they became a touch point for the large elements in the landscape," says Paul Inglis. According to him, the secret to making the Trash Mesa feel real was layering. "By adding elements of different scale, you prevent it from looking one-dimensional. Then you add the rain and a world starts to appear. A sort of Monument Valley of steel."

It was a long and winding road to make the Trash Mesa come to life. First, there were storyboards, concept art, and previs. Then Weta brought their vision to life in miniatures and filmed them in New Zealand. Later a full-scale backlot set was built in Budapest, where scenes were shot with actors, stunt crews, and hundreds of extras. Finally, once principal photography had been completed, John Nelson's VFX team delivered the finishing touches in Los Angeles.

>>> "A MONUMENT VALLEY OF STEEL."

—PAUL INGLIS, SUPERVISING ART DIRECTOR

THIS SPREAD: Concept art of the epic Trash Mesa environment. "Another one of our principal sources of reference was the devastating damage caused by the Fukushima tsunami," recalls John Nelson.

When Weta Workshop started working on the Trash Mesa miniatures, they wondered how they would build the industrial trash. What colors and textures would be required to create the illusion of gigantic, rusty steel structures? They also encountered an interesting scale challenge, recalls Alex Funke. "The pieces of ships that we built were only 500 millimeters high, yet they're supposed to feel 100 meters high. At that scale, the ground texture has to be very small, so there was a very careful balancing job. We would've been happy to build the pieces much larger, but there wasn't enough room in our studio."

The miniatures had to seamlessly tie into the outdoor set being built in Eastern Europe as well. Every day, Denis Villeneuve, Roger Deakins, and John Nelson watched dailies in Budapest and sent notes to the Weta team to further clarify their artistic vision.

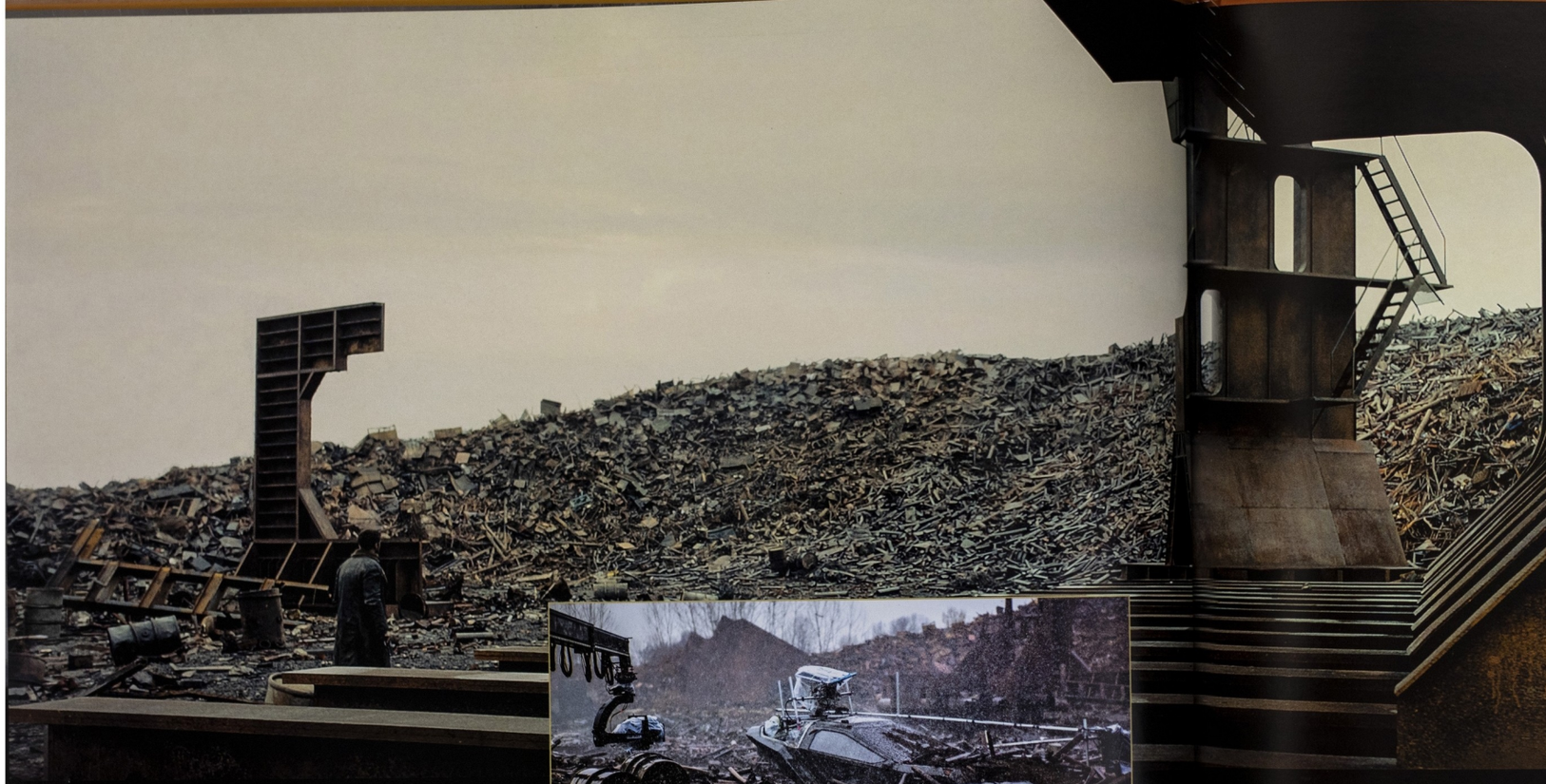
It took an army to make this world come together, explains Alex Funke. "On one of these sets, there were 20 people working on it, so that's 20 minds, 20 hearts, 40 hands, and 40 eyes that have contributed to the look of what we're filming."

TOP LEFT: Weta builder paints the surface of a key structure in the Trash Mesa build.
TOP RIGHT: Weta builder sits atop the build as she applies the proper texture to the landscape.
BOTTOM LEFT: Weta builder applies smoke to create the proper environment for the Trash Mesa shoot.
BOTTOM RIGHT: A camera moves through the final build of the Trash Mesa.

ABOVE: A Weta builder walks through the massive Trash Mesa miniatures.

SCAVENGERS

Large garbage truck Spinners pollute the Trash Mesa sky as they hover over the wasteland and dump tons of rubbish on the desolate suburbs. Only the poorest and most desperate humans live in these fields of debris. "A whole new community based on recycling lives there," says Denis Villeneuve. "They specialize in breaking down abandoned ships and salvaging the pieces." Scavengers boorishly hunt the wastelands to get their hands on any valuable goods or materials they can refurbish or sell.



K's arrival at the Trash Mesa does not go unnoticed. Completely disconnected from urban life and concerned only with survival, scavengers don't immediately realize what they're up against.

Shot in November 2016, this set was the biggest outdoor backlot built for this movie. The crew arrived early each morning to a frost-covered landscape, with wooden structures jutting out like looming silhouettes. Some of these were four stories high and painted to look like ship parts. Tons of junk metal were scattered all over the set, except for areas reserved for stunt performances, which were covered with fake metal pieces made of foam. The challenge was curating thousands of unique pieces of scrap to keep the same color palette of rust and gray.

TOP RIGHT: Set dressers carefully scatter pieces of metal on the backlot creating the hazardous landscape.

MID RIGHT: Denis Villeneuve giving instructions to extras playing scavengers.

BOTTOM RIGHT: Photography of the stunt work performed for this scene.

LEFT: K's Spinner filmed in the rain.

THE ORPHANAGE

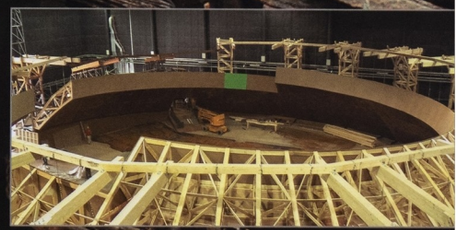
Approaching cautiously on the dangerous terrain, K finds what he was looking for. The overturned satellite dish repurposed as an orphanage sits eerily in the deserted landscape. "The wasteland was an inspiring location for the orphanage and the discarded youths working there," says Dennis Gassner. The dish houses hundreds of abandoned children being put to work, sorting trash and salvaging computer pieces. "It was tricky because we had young kids on set," recalls Doug Harlocker. "They were supposed to be working with sharp objects, but we found some safe materials they could play with. We were having them harvest chips and fans from old computer parts. We had a truckload delivered on set, along with tools that wouldn't hurt them. We were successful in preventing it from turning into a bloody mess. [LAUGHS]"

LEFT: K nears the orphanage as seen in the film, offering perspective of the expansive Trash Mesa.

RIGHT: Ryan Gosling performs in front of a green screen used to insert the matte painting of the orphanage in post-production.

TOP RIGHT: Concept art of the initial design of the orphanage.

FAR RIGHT: Standing at the impressive height of 29 feet and spreading out with an inner diameter of 125 feet, it took 20 carpenters to construct the wooden satellite dish and 12 painters to create the look of rusted steel. "The orphanage sorting room was built at full scale over a period of 10 weeks," says Paul Inglis. "A structural engineer designed a cantilevering system to allow the partial dome to sit safely on the stage without internal columns to support its weight."



Walking onto the orphanage set, you were first hit by the smell of the 350 tons of humid earth trucked in to cover the studio floor and create relief. Dark tunnels led to the sorting room, where 20 cubic meters of computer waste had been laid out for the 300 children cast to play orphans. Wearing dirty clothes and getting rough buzz cuts, some kids were too afraid to even set foot on set, let alone play with the computer parts. Over the three days of filming there, 1st assistant director Don Sparks led the young cast by speaking English, Hungarian, and Chinese. "Kids are loud in every language. Getting them to focus is challenging. They get tired, hungry, and bored of doing the same thing over and over. You have to keep them engaged and entertained while getting the performances you need."

Precise calculations went into determining how to build the satellite dish to allow Roger Deakins to create the perfect simulation of natural light seeping through the damaged structure. The dish was built full-scale, but a few green screens were used to integrate VFX set extensions in post-production, adding deterioration and depth.

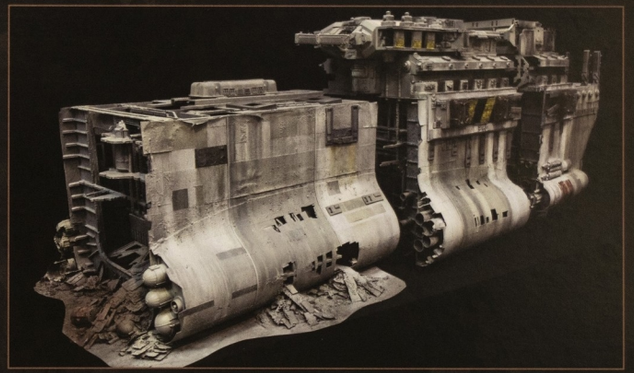
"IF THIS IS WHERE
HE SPENDS HIS DAYS,
NO WONDER HE'S
A LITTLE TOUCHED."

—LENNIE JAMES, ACTOR PORTRAYING MR. COTTON

MR. COTTON

As K stumbles upon hundreds of these abandoned children, he is led to the man who takes care of them, for better or for worse. Actor Lennie James plays the complex character of the orphanage director. "Mr. Cotton feels justified in what he's doing, because he's protecting them from a far worse existence. These kids are looked after, even if they're indentured servants."

Working with director Denis Villeneuve, Lennie James developed idiosyncrasies that would show just how affected he was by this toxic environment. "Beyond his blustering facade, Mr. Cotton would reveal his weakness by mumbling incomprehensibly to himself and Lennie found the edge I was looking for," says Villeneuve. "I think on the page he was more brutish warlord," adds Lennie James. "We created a richer character in which you hopefully see his present, his past, and a sense of what his future might be."



ABOVE: A miniature model of a supertanker was built by Weta to establish the shape and level of deterioration of the one featured in the Trash Mesa. It was also used as a reference for VFX set extensions to transform the Inota Power Plant into a ship hull.

THIS SPREAD: This concept art illustration further elaborates the geography of the Trash Mesa, tying in the orphanage with its surroundings and its proximity to the tanker in which Mr. Cotton has built a makeshift home.

>>> "YOU SEE THIS WORLD ON SCREEN AND YOU WOULDN'T BELIEVE IT WAS REAL. YET I'M STANDING HERE IN THE REAL WORLD AND IT'S JUST STAGGERING. HOW DID SOMEONE MAKE THIS? HOW IS THIS JUST HERE?"

—LENNIE JAMES, ACTOR PORTRAYING MR. COTTON

The interior of the ship was shot at Inota Power Plant, an hour and a half outside of Budapest. The construction of this building was completed in 1950 under Stalin's rule. It was originally an energy plant that ran on coal and lignite until it was shut down in the '80s. It stands today as a time capsule, untouched except by the forces of time. "It was quite visionary in its architecture, but the biggest problem for me was safety," explains location manager Emma Pill. "We had to feed wires down through the ceiling and string a net across to catch falling debris."

The brutalist Soviet design is enigmatic and transcends the essence of this scene. The original footage shown above offers a glimpse of the intricacies of the 10-story building. Beside it, a shot of that same room as seen in the film after the VFX transformation. "They had to make the inside of the factory seem like a ship," explains John Nelson. "So they bent the sides of the power plant to look like a ship hull and took away all semblance of concrete to replace it with steel piping and gurneys."

Mr. Cotton's quarters was a small but elaborate set built in studio. As you entered, you found yourself in a makeshift bachelor pad and a surprisingly welcoming cocoon. "It's a sanctuary safe from the brutal world," says Dennis Gassner. "When we designed this wonderful set, there was this idea that Cotton had been selfishly collecting the most valuable objects found in the Trash Mesa. It's a fusion of hard work and whatever little pleasures he can enjoy in this harsh environment. He is a king in this world, and this office is a little bit like his throne."

This set was an interesting environment for the set decorators, as they added their own twist, recalls Alessandra Querzola. "Through the 30 years he's been living here, Cotton's mind has become disturbed. You can tell he's been building layers and layers of items, with no system. So when we started this set, we worked with a foundation and then decided to see how it would become after three decades of madness. This is the result."

TOP: Concept art of Mr. Cotton's office.

LEFT: Production stills from the scene.

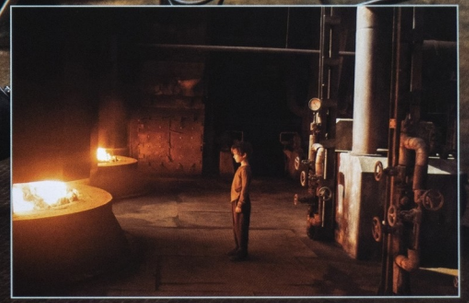
FAR LEFT: Roger Deakins filming Ryan Gosling and Lennie James in Mr. Cotton's haven, where Cotton keeps his records and precious belongings.

BOILER ROOM

K's investigation leads him to the depths of the abandoned tanker and the cavernous boiler room. This concept art offers a precise representation of the full-scale boilers later built on set.

The Inota Power Plant was the ideal location for the boiler room. Maze-like tunnels lead to the complex apparatus towering over the open space. The Art Department built three large boilers and additional piping from scratch. The added set elements were so convincing, they looked like they were part of the original structure. "It was a fairly easy set," admits Camille Verhaeghe. "What was there was already amazing. It was just a matter of adding those big boilers and staging the right elements, but we didn't have to do a lot more than that."

Special effects supervisor Gerd Nefzer had his share of challenges, though. It was his task to find a way of having fire raging in the boilers while keeping within safety regulations. "We produced some fake lignite coal, because we cannot use flammable materials on the stages. We found original lignite at a lignite mine and then made a mold, so we could then make our own out of ceramic fiber and plaster. You can put those in the fire, but they're not actually burning. It's always a controlled fire."



RIGHT: Actor Andre Lukacs Molnar stands in front of the fake boilers, in which a real fire rages on. The SFX team used non-flammable fake coal that looked like real lignite, but the flames could be extinguished with the flick of a switch.

THIS SPREAD: Set photography of the Inota Power Plant with Ryan Gosling filming a scene by the large boilers.

THE DESERT

This is Las Vegas, as you've never seen it before. It's completely transformed by time, yet still oddly familiar. Not a soul lives here, except perhaps the person K is looking for. "Hampton Fancher wrote something in the script I found quite amusing," says Ridley Scott. "Somebody did the world a favor and dropped a dirty bomb on Las Vegas, and it would take decades for it to be safe again." Time has passed since then and contamination has decreased, but no one has dared to set foot back here again, until now.

FULL VEGAS EXPERIENCE

In 2049, Las Vegas has not only become a ghost town, it has also been "Blade Runnerized." The challenge was to bring this iconic city into a dystopian future, just as Ridley Scott had done with Los Angeles in the first film. Dropping a dirty bomb on the city was a good start. The blast would have been strong enough to obliterate human life, but not enough to destroy buildings. But what would the cityscape look like in this version of the world? "Only one man could answer that question," explains Denis Villeneuve. "So I went back to Syd Mead, the visual futurist of the original *Blade Runner*."

Syd Mead accepted the challenge to design a futuristic version of this city, and make it correlate with the universe he had created for *Blade Runner* three decades earlier. "If you can look it up on Google, it's been done," says Syd Mead. "People hire me to design future stuff that nobody knows what it's supposed to look like." In early discussions, Denis Villeneuve sent a picture of Dubai as his inspiration for the future Vegas. From that point on, Syd Mead started sending elaborate drawings that captured the imagination. "My job was to follow the lead of the director and put my mind to work as to how similar this should be to the first one," explains the visual futurist. "I tried to make it look very exotic, but left uncared for–which essentially was the look in the original film. I had labeled it 'retro deco' or 'trash chic.' That was the style."

Syd Mead created several new buildings, but preserved some present-day landmarks such as the Luxor and the MGM Grand. "The trick to showing the future is to have familiarity trigger points," Mead explains. "Entering the city on Las Vegas Blvd., the pyramid still stands there. I just put a larger tripod pyramid over it. My idea was that the 'premium suites' would be located in the three legs of this 'over pyramid,' with the cheaper rooms in the original structure."

"Syd Mead is one of the last great futurists of our time," states Denis Villeneuve. "I know that the Las Vegas we did is a *Blade Runner* Las Vegas. I'm very happy about that."

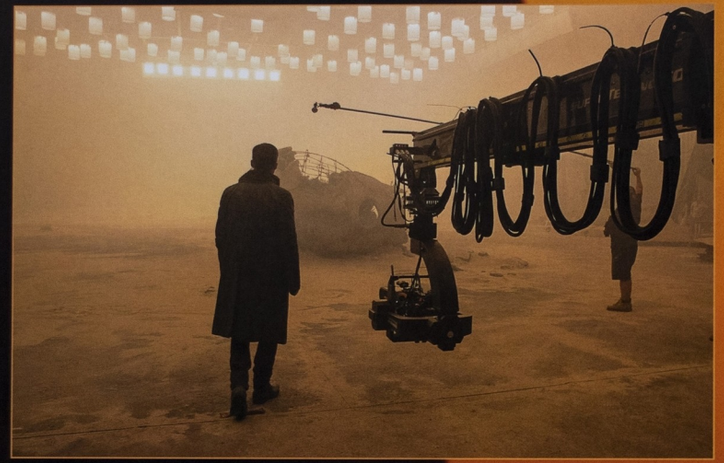
Much like Villeneuve's vision of Los Angeles, Las Vegas has expanded in height and depth with tall buildings rising up in the distance and subterranean casinos nestled within canyon walls. Everything about the city is over-the-top, yet it's eerily empty. "It's sort of a Chernobyl in our world," explains Paul Inglis. "The radiation may be gone, but there's such a stigma that it will never be deemed worthy of habitation again."

Syd Mead's Vegas designs were converted into these 3D layouts, adding depth, detail, and overall realism. The Luxor hotel, the MGM Grand, and the Caesars Palace (further on the Strip) are the only iconic landmarks remaining from the original city. Urban development has been overrun by new casinos and buildings, all connected by a monorail and a network of overpasses.

BELOW: Rust colored dirt was brought to the Origo Studios backlot and landscaped to match the topography of the Vegas outskirts. In this picture, Ryan Gosling walks towards a green screen, held in position by a crane. The scene was one of the bigger shots to be composited in VFX, as seen in the spread. "These days, movies have up to 2,000 – 3,000 VFX shots," says Karen Murphy. "On this production, we have a little over 1,000 shots with artists working at seven facilities and just as many time zones."

It was important to Alcon that the movie respect both the spirit and the geography of Las Vegas. "I started going there when I was 18 years old," says producer and Alcon co-CEO Andrew Kosove. "It's an interesting place, because it can be fun, naughty, exciting, but there is also a sense of desperation and selfishness. It's a merciless give and take. And I find the dichotomy fascinating."

In April 2016, Kosove and fellow producer and Alcon co-CEO Broderick Johnson took Villeneuve on a four-hour road trip to take in the desert views and watch the city of Las Vegas emerge from the horizon. "We wanted to soak up the Vegas experience before making the movie," explains Kosove. "I wanted all of us to experience driving across the desolate Mojave Desert and into Las Vegas. When we first encounter the iconic city in the film, it embodies a lot of that."



SPREAD: The rich color of the Las Vegas footage was not an afterthought. Denis Villeneuve and Roger Deakins decided early on to shoot the scenes using camera filters to create the warm hue. Once the scenes were filmed with that tint, there was no turning back. "Roger and I share the same philosophy," says Villeneuve. "We don't believe in making creative decisions in post-production. We prefer to commit to an idea on set and follow through to the end."

THIS PAGE: The colossal head, hands, feet, and female figures were built as full-scale statues and installed on wheeled platforms to be easily moved on set. Additional 2D cutouts were also constructed to create forced perspective. Since sex is not taboo in 2049, these statues were designed to explicitly represent pleasure for both men and women. "These huge figures depict a celebration of sexuality," explains Paul Inglis. "It's ironic that it frames the existence of a man, living a solitary life for decades right next to depictions of coupling."

STATUE GARDEN

As K moves deeper into the city, he enters an erotic statue garden. Originally created as a playful tourist attraction, the decaying sculptures now serve as a dreary reminder of the ghostly present and toxic past of this environment.

The yellowish hue of the desert was directly inspired by a sandstorm that hit Sydney, Australia in 2009. It became the visual reference in setting the tone and mood for the desert scenes. "Yellow is very important in the movie," explains Denis Villeneuve. "It's a color I associate with childhood imagination and with madness. In this case, it's linked to K's desire to be human. Throughout his journey, he follows a trail of yellow clues, leading him to this yellow world."

THE VINTAGE CASINO

The unusual and unexpected sound of piano music leads K to the fictional Vintage Casino and Hotel. In the spirit of thematic Vegas casinos, this futuristic locale celebrates old-school gambling and entertainment. Japanese and Korean lettering on the front entrance once welcomed international tourists, most of them landing at the local spaceport from Off-Worlds.

The exterior of the building was created by combining studio footage with VFX set extensions. The interior, however, was filmed in an empty centennial building located in the heart of Budapest. It had great scale and interesting neo-classical architecture, but it also had a soul, which could've never been replicated on a set. "We were lucky to find this amazing piece of architecture," says Dennis Gassner. "The building was in bad shape, but with a tremendous amount of work by the Art Department, we made it look good."

LEFT: The exterior entrance of the Vintage Casino was built in studio as a functional set. The VFX team then took Dennis Gassner's hotel design and integrated its facade into the set extension of the final render.

THIS PAGE: The Art Department created an enigmatic vintage setting by adding red carpets and a thick layer of dust to the old building lobby. The actual space (seen here to the right) needed very little restoration compared to other rooms featured in the film.

It took over two months to transform the old Hungarian building into a Vegas casino. The ornate architecture offered a good base to work with, but the walls and flooring were in dire need of restoration. The Art Department first refurbished the rooms to make them look like new, then aged them again to fit the director's vision. On set, crew members wore masks as large amounts of dust were pumped into the atrium. It achieved the desired result of looking like a hotel lobby, where guests had left in a mad rush decades ago. "Alessandra Querzola, our decorator, and I decided on the general feeling of the old-school casino," says Dennis Gassner. "We manufactured all the larger pieces, such as the chandelier and the front desk."

ABOVE: A side-by-side comparison of the initial concept art and the resulting footage featuring an original skylight in the building, complete with old dirt. Villeneuve was adamant that no one clean the glass, not only because it added realism, but also because he found it "beautiful as it was."

LEFT: The view of the atrium, before restoration and set dressing, allows us to observe the state of the original building. Some walls show signs of its past interior decor. Others have been torn down. "The building wasn't completely derelict," recalls Camille Verhaeghe. "They had to freshen it up, then age it again. After filming, they had to bring it all back to the way it was originally."

BELOW: Sam Hudecki's storyboards once again illustrate Villeneuve's and Deakins' meticulous planning of every shot.

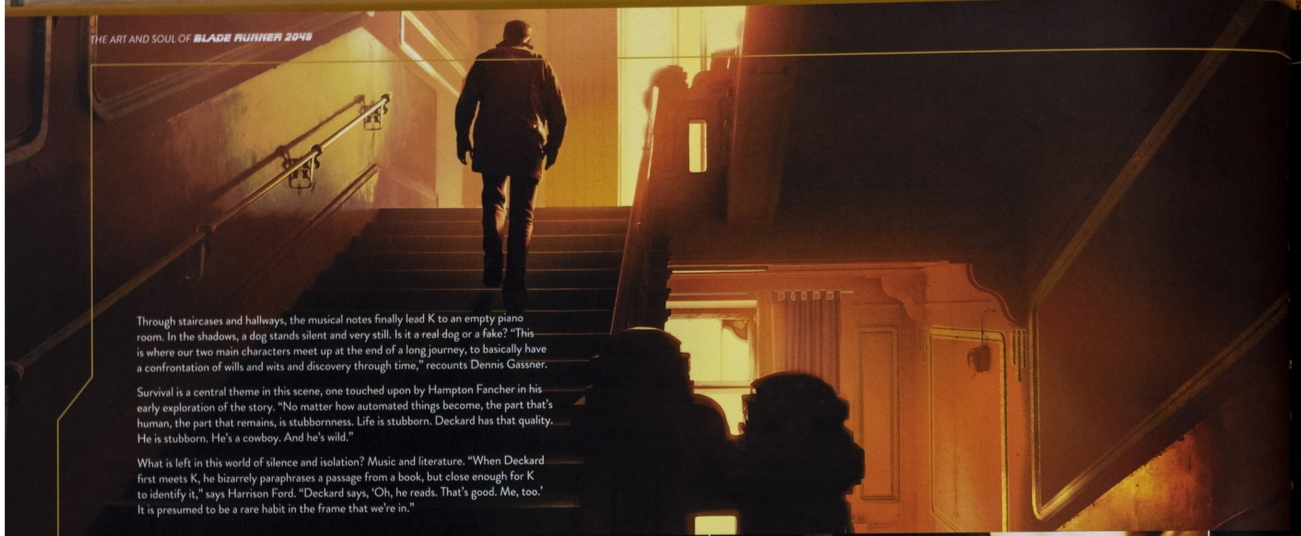
If walls could talk, these would tell a century's worth of stories relating to market trading, broadcasting, and now filmmaking. Built by the prolific Hungarian architect Ignác Alpár, the building originally housed the Budapest Stock Exchange from 1905 to 1948. It later became the national state television headquarters. The crew referred to it as the MTV building, which stands for Magyar Televízió. "We had to be careful, because it was a protected historical building," recalls Emma Pill. "When the Art Department wanted to knock down a wall, I'd have to step up and say, 'No, you can't do that.'"

This room underwent the biggest transformation from its original bare-bones state to the spectacular casino environment seen in the movie. When the crew first scouted the building, this space was nothing more than a cement cube with square pillars, a low ceiling, and damaged flooring. It took a lot of imagination and restoration to turn it into the luxurious gaming room seen above. In the end, the room had wall-to-wall carpeting, large ostentatious columns, gaming tables, and a full bar – all softly lit with Roger Deakins' yellow Vegas hue.

LEFT: On one end of the room, a wall covered by green screen was used to add depth in post-production. These before and after pictures highlight the work executed by John Nelson's VFX team, turning the small space into a vast casino forum and expanding not only the scale of this environment, but also its sense of emptiness. Physical elements, such as a chandelier, sign, tables, and chairs, anchor the shot in reality.

ABOVE: Roger Deakins films Ryan Gosling entering the room. "It's a very strange scene, let's face it," jests Deakins. "Our main character visits our future Vegas, which is basically an empty, red desert. He walks into a casino, following the sound of some music."

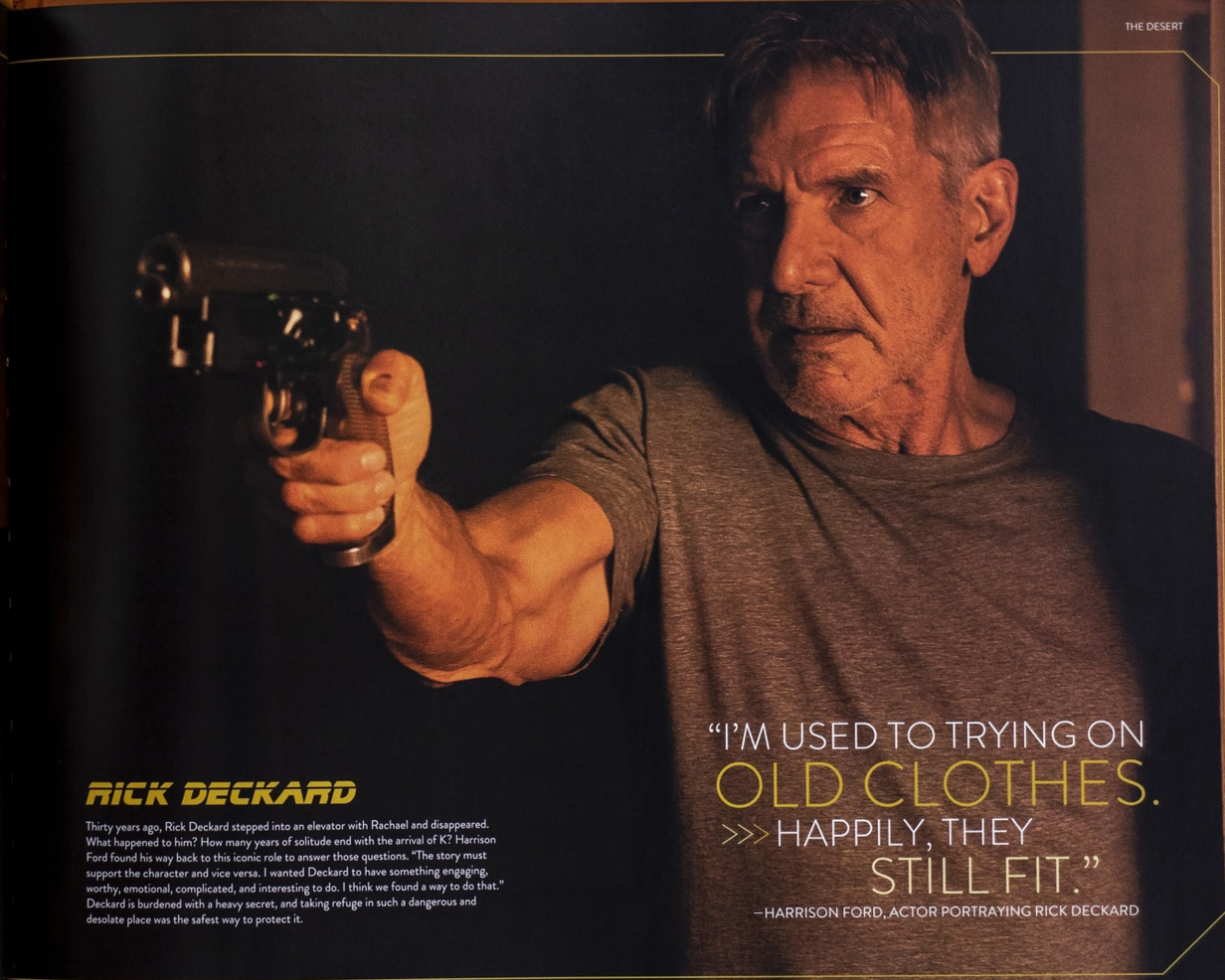
BELOW: Storyboards show K walking into the gaming hall, where he sees a pyramid of empty alcohol bottles. "I think Deckard has become an alcoholic who has lost everything," says Hampton Fancher. "He's waiting to die."



Through staircases and hallways, the musical notes finally lead K to an empty piano room. In the shadows, a dog stands silent and very still. Is it a real dog or a fake? "This is where our two main characters meet up at the end of a long journey, to basically have a confrontation of wills and wits and discovery through time," recounts Dennis Gassner.

Survival is a central theme in this scene, one touched upon by Hampton Fancher in his early exploration of the story. "No matter how automated things become, the part that's human, the part that remains, is stubbornness. Life is stubborn. Deckard has that quality. He is stubborn. He's a cowboy. And he's wild."

What is left in this world of silence and isolation? Music and literature. "When Deckard first meets K, he bizarrely paraphrases a passage from a book, but close enough for K to identify it," says Harrison Ford. "Deckard says, 'Oh, he reads. That's good. Me, too.' It is presumed to be a rare habit in the frame that we're in."



RICK DECKARD

Thirty years ago, Rick Deckard stepped into an elevator with Rachael and disappeared. What happened to him? How many years of solitude end with the arrival of K? Harrison Ford found his way back to this iconic role to answer those questions. "The story must support the character and vice versa. I wanted Deckard to have something engaging, worthy, emotional, complicated, and interesting to do. I think we found a way to do that." Deckard is burdened with a heavy secret, and taking refuge in such a dangerous and desolate place was the safest way to protect it.

"I'M USED TO TRYING ON OLD CLOTHES. >>> HAPPILY, THEY STILL FIT."

–HARRISON FORD, ACTOR PORTRAYING RICK DECKARD

HOMAGE LOUNGE

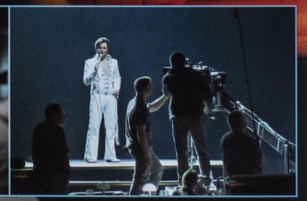
K is the first being that Deckard encounters after decades of living in hiding. And he's a little on edge. "He knew someone would come after him," explains Joel Kramer. "So he fights K in self-defense." Deckard flips on a switch, and an old automated hologram show starts playing, making it tough for K to hide with the bright lights and disorienting musical spectacle.

Visually, technically, and logistically, this was one of the most challenging scenes to capture. Over four months, Denis Villeneuve and Roger Deakins mapped out every detail of the fight, the lights, and the holograms. Yet the biggest challenge was deciding which of these elements would dictate the shots. They finally concluded that music would lead the way. Villeneuve started by editing a glitching version of Elvis Presley's 1970 Vegas rendition of "Suspicious Minds," and the song became the baseline for everything that followed. Roger Deakins' lighting came next. The Art Department then designed and built an extensive set on which Ryan Gosling and Harrison Ford filmed their fight scene. The holograms were shot last to be able to adjust their performances around the main actors, not the other way around.

This bird's eye view of the set seen here offers a unique perspective of the casino lounge, its stage, and (in the foreground) the multiple lighting rigs.

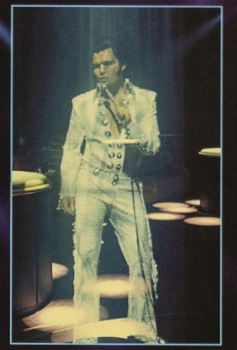
All departments were involved in solving the complex puzzle of bringing this innovative scene to the big screen. No detail was neglected. "Working with Roger Deakins means that each shot needs to look fantastic, like a tableau," explains Denis Villeneuve. "The holograms could not look fake or be added in post-production. Everything had to be meticulously planned. It was a challenge."

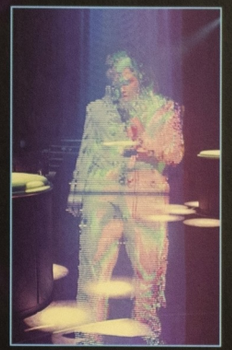
"I spent a few weeks mapping out different lighting patterns," recalls Roger Deakins. "Then I worked with a local company in Budapest designing them with computer animation. And we went from there." It was an unlikely challenge, says the cinematographer. "I've never been to a Vegas show and I never want to. It's not something I've ever done before. But maybe that's my future, doing rock 'n roll shows. [LAUGHS]"

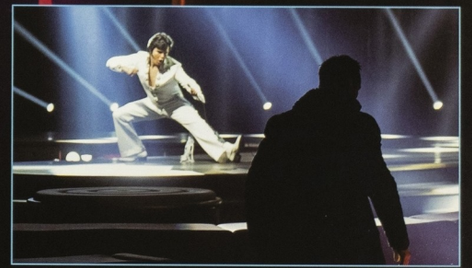


THIS SPREAD: A variety of dance styles were incorporated into this scene to give it a sense of chaos: psychedelic Go-Go dancing, Bollywood, and Folies Bergère. "We had around 50 dancers and performers," says Victoria Jaross-Giorgi, the local choreographer. "I'm very proud and happy this scene was shot in Budapest, because we could highlight Hungarian artists."

RIGHT: John Nelson's VFX team explored many different visual styles before deciding on the final appearance of the holograms. They had to look faded and a little distorted, because they were being projected by a 50-year old, broken-down computer system. "The holograms had to feel like they were being played on an old, rotten VHS tape that glitches," explains Denis Villeneuve.







After Deckard and K's fight, filming the Vegas holograms triggered a drastic change of pace. "The world we created is so bleak, so this was candy," says costume designer Renée April. "I had fun with colors, using bright yellow, as well as feathers and glitter."

Much like the presence of technology in this world, all of the performers resurrected in the holograms were pre-1982 icons. "You get a sense of these ghosts from the past in this big, dysfunctional machine," explains Joe Walker. The editor got involved in the creative process of this scene more than he expected, joining second unit on set to capture the exact shots he needed for the Villeneuve-approved cut. "We would do numerous passes with lights on, with smoke, without smoke. Each take was timed to a cut I had prepared carefully, with every detail of what you'd see in each final shot."

When Walker returned to the edit bay with his collection of holograms, he quickly realized that too much of a good thing is not good. "We built this crazy soundtrack with 14 concurrent pieces of music. It was an onslaught of sound. And although it was visually dazzling, the scene became all about the holograms. It wasn't about Deckard, who the last time he met a Replicant, it was Roy Batty." Once Walker started to pull back on the abundance and minimize the chaos, the scene found its rhythm. "The scene had to become a manhunt, where there was a risk of someone getting shot in the head."

ABOVE: Instead of using green screen to add the Vegas skyline in post-production, a physical backdrop was designed and painted to simulate the horizon seen from Deckard's penthouse. "I think physical environments are enormously helpful," says Harrison Ford. "Many of the sets are augmented with VFX, and that's all right. But what I like to see is a preservation of human scale."

LEFT: Early concept art of Rick Deckard's evolution.

PENTHOUSE

Deckard invites K into his penthouse, where he's been hiding out for the past few decades. There are books, paintings, and various valuable artifacts, which reflect years of rummaging hotel rooms and Vegas shops. There is a certain order to his clutter, just as there was in his old apartment in Los Angeles. And this is the perfect setting for an intimate conversation.

"When Deckard meets K, there's an echo of himself in this kid," says Hampton Fancher. "He doesn't want anything to do with it. But at the same time, it compels him." Officially K is on a mission seeking information, but this budding relationship has an impact on him, explains Ryan Gosling. "He feels a bond with Deckard, which is deeper than their shared experiences." The emotional context is what Harrison Ford valued most about the script. "It's a very brave storyline. Especially in the world of futurism and hardware and conjecture, seeing real human relationships adds to the potential for an audience's engagement with it."

This human connection followed the actors off set, where they nurtured a friendly and humorous rivalry. "Because of the contentious relationship between our characters, I think we found a way to keep that alive in a more entertaining way for ourselves off-camera," explains Ryan Gosling. "One thing I loved about working with Harrison, and will miss, is the elegant balance he's able to strike between taking the work as seriously as anyone I've ever worked with, and yet not taking it so seriously that he forgets to enjoy the process."

It was a long time coming for Harrison Ford, who remembers thinking of Ryan Gosling when reading the script originally. "I thought it contained a really good part for Ryan, and I was very enthusiastic about proposing the idea to the producers. And they said, 'Oh yeah, we know. That's who we have in mind, too.' I very much enjoyed working with him. He's a terrific performer; very thoughtful and brings a real credit to our combined ambition."

ABOVE: The Wurlitzer is a holographic jukebox, which projects a video of Frank Sinatra singing "One For My Baby (One More For The Road)." Filmed separately, the hologram features Stephen Triffitt replicating a 1962 performance at the Royal Festival Hall. "Frank Sinatra is timeless," says Denis Villeneuve. "That's why we felt he belonged in the *Blade Runner* world."

BELOW: Deckard's blaster from the first movie had to be recreated, because the original had been sold for $250,000 to a collector in Los Angeles. Doug Harlocker reached out to the owner to analyze every detail in order to make a perfect copy. "It was sort of a surprise to see the transparency of the handle. Since it was always in Deckard's hand, it appeared dark. It also had this funny little switch on the side. It's made up of two guns: a Steyr rifle receiver, which was just a cosmetic piece on the gun, and they put a Bulldog .40 caliber snub nose in the gun to fire it." The prop department made four replicas of the blaster, three with real weapons in them and a lighter rubber version for action scenes.

RIGHT: Edible vegetables are unavailable in 2049. For sustenance, these hydroponic Grow Pods provide algae-type nutrients. "This greenhouse survival machine may have been salvaged by Deckard from an abandoned spaceship," explains Sam Hudecki, who designed the device.

TOP LEFT: Ryan Gosling in action during a stunt sequence. "I implemented Krav Maga moves and visceral take downs," says Joel Kramer. "The actors learned real lethal maneuvers to make their characters look deadly. They're not just flashy moves."

LEFT: Attached to cables, stuntmen Mike Massa and Adam Hart are yanked back to hit the wall and floor in the explosion scene.

INTRUDER

Filming the action-packed scene in the penthouse was an impressive and spectacular moment to take part in. "This scene encompasses all of my artistic inspirations, from Ridley Scott to French comic book artist André Franquin," enthused Denis Villeneuve. "I don't get impressed easily," says SFX supervisor Gerd Nefzer. "But when that huge Spinner flew into the window, it looked fantastic."

The entire crew was astounded as they watched the full-scale Spinner enter the penthouse, turn around with a gust of wind, and land softly as actors safely stepped out the vehicle. The Special Effects team went to great lengths to build this epic flying apparatus. "It's one of the most difficult rigs we ever built," explains Nefzer. "The Spinner is sitting on a hydraulic piston to lift it vertically. This piston is then mounted on a Lazy Susan ring, so we could turn it 360 degrees. Finally, we had a three-dimensional rig to make it fly smoothly like a helicopter. The animation computer program connected to the rig could calculate, execute, and repeat the movement of the Spinner with a precision of 1/10th of a millimeter."

"It's amazing what they can do with CG these days," joked Roger Deakins on set. The picture seen at the right shows the Spinner in a static position between takes. The Visual Effects team later painted out the rig and added detail and depth to the background.

THE SEA

In stark contrast to the desert, the final chapter brings us to the ocean and the complex challenges of filming the climactic events of the Sea Wall set piece. This aerial shot of Iceland was filmed by Dylan Goss, using a custom-made six-camera rig from a helicopter. "We came up with cool new technology," recalls John Nelson. "We took six Alexa cameras and put them into a gyrosphere and overlapped them to create over 180 degrees of moving footage."

SEPULVEDA SEA WALL

In this dystopian future, ocean levels have risen to such levels that a Sea Wall was built along Sepulveda Boulevard to protect the city of Los Angeles from complete obliteration. The enormous structure overtowers even the tallest skyscrapers, serving as a constant reminder of the dangers of living on Earth. Due to its scale, the Sepulveda Sea Wall was created with visual effects, but great effort went into building a practical set to film the actors in this environment.

The scene was originally scheduled to be shot in an existing water tank in Malta, which created a logistical puzzle. Executive producer Bill Carraro came up with an ingenious and risky idea. "Although tanks were available elsewhere, none of them could achieve the dramatic weather effects that Denis wanted for such a climactic scene. So I suggested we build our own."

Denis Villeneuve and Roger Deakins felt this was a "film-friendly" decision. Building a tank from scratch meant it would be designed to meet all the requirements to capture this complex scene as it was envisioned. As an added bonus, the studio was actually saving money by not moving the crew to another country. In fact, the build site was situated only eight minutes away from their Budapest studio.

"Bill deserves all the credit for that," says producer and Alcon's co-CEO Broderick Johnson. "It's one of the most important production decisions we made for the film. And boy was it a great thing. It would've put tremendous stress on Roger and Denis to move the crew to Malta. It allowed us to shoot the entire movie in Budapest." It was a win-win situation; the challenge was to have the new tank constructed and delivered within a three-month time frame.

The construction of a new million-gallon water tank was an ambitious project with a long-term vision. "It was a mad rush to get the appropriate permit, because it wasn't a temporary structure. We had decided to build something that would have some legacy for the film and be left for the Budapest film community to use after we left."

By October 6th, 2016, Bill Carraro and the Special Effects team had custom-built not only one of the largest exterior water tanks in the world, but also dump tanks, wave makers, and rain rigs to create the required weather conditions. Every detail of the tank was carefully calculated. "It had everything we needed," says Gerd Nefzer. "We even had a great heating and filtration system to keep the water clear and comfortably warm for the actors."

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—BILL CARRARO, EXECUTIVE PRODUCER

PAGE LEFT: Two custom-made rigs were built to operate the four-ton limousine on the Sea Wall, explains Gerd Nefzer. "For Denis, it was very important that the limo move with the waves and not sit in the water like a stone." One of the rigs was designed like a rollercoaster track to make the vehicle drift naturally into the ocean. A hydraulic piston and four big air lifters were also used to rock the limo with the incoming waves as it sunk.

TOP RIGHT: The crew sets up at dusk and tests dump tanks, water cannons, wave systems, and rain rigs.

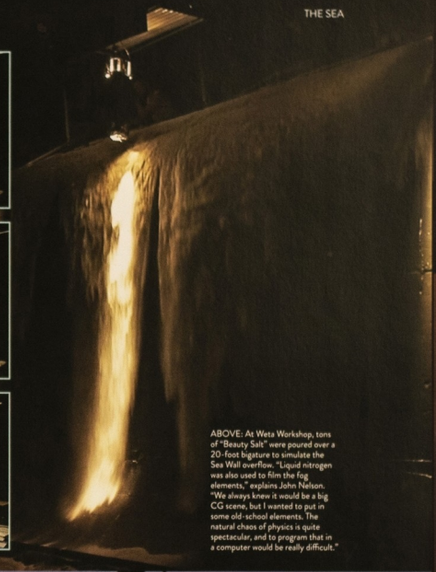
BOTTOM RIGHT: The backbone of the Sea Wall stands 30-feet high and requires five flights of stairs to reach the top. Three vents jut out of the large heaters used to keep the water warm.

BELOW: Time lapse of the Sea Wall tank construction over three months, starting with the first breaking of the ground at Mafilm in Budapest. After the 130-square foot tank was dug out, a concrete foundation was poured to make the 5-foot deep reservoir with a 15-foot central deep-end. The Sea Wall itself was then built at the far end of the tank, where two vehicles were placed into position surrounded by various practical effects equipment.

ABOVE: Two large cranes were operating at the same time during the shoot: one to position the 150-feet long rain sprinkler above the tank and a second 350-ton crane to lift the limousine in and out of the water with a spreader-bar. "It was a beautiful ballet of machinery," recalls Nefzer.

ABOVE: Gerd Nefzer went to great lengths to make the perfect waves in the tank. "We invented a new system by renting three huge diggers and bringing in 8,000-liter propane tanks. We were pushing those down in the water at a certain speed, which created big and beautiful waves."

LEFT: The Special Effects Department also built the dump tanks. Each tower had two large water buckets, each capable of holding two and a half tons of water. When the tanks were released, a five-ton deluge rocketed down the slide and propelled through the air, creating giant waves crashing onto the Wallace limo.

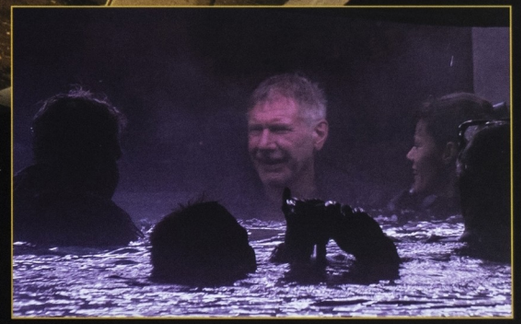


ABOVE: At Weta Workshop, tons of "Beauty Salt" were poured over a 20-foot highture to simulate the Sea Wall overflow. "Liquid nitrogen was also used to film the fog elements," explains John Nelson. "We always knew it would be a big CG scene, but I wanted to put in some old-school elements. The natural chaos of physics is quite spectacular, and to program that in a computer would be really difficult."

BELOW: While exterior Sea Wall shots as seen above were filmed on location, the interior shots of Luv and Deckard inside the limousine were filmed in studio. Like a flight simulator, the vehicle was installed on a motion-base gimbal while rain and wind machines simulated the harsh weather conditions outside.

THIS PAGE: The crew spent 10 days shooting at the Sea Wall, or more accurately ten cold nights. Keen on sticking with his team, Denis Villeneuve got into the water to direct the actors, recalls script supervisor Jessica Clothier. "The work conditions were tough, because the limo was out in the middle of the tank, but we all loved watching Denis as he bobbed around in his dry suit."

At least the water in the tank was heated, which surprised even Harrison Ford. Three large water heaters kept the temperature at 78-82 degrees Fahrenheit. "When we shot with Harrison, we took a hose and had warm water pumping into the sinking limo," says Gerd Nefzer. The shooting conditions were demanding, but spirits were high. Before one of the more challenging shots, Harrison Ford yelled out, "If anything goes wrong, Ryan can have my trailer." Everyone burst out laughing, especially Gosling.



On principle, director Denis Villeneuve steers clear of the "fake moon" lighting effect. He and cinematographer Roger Deakins prefer filming realistic night scenes with natural light sources. On this film, they decided to use only the lights emanating from K's Spinner and Wallace's limousine. "It's actually quite minimal and everything falls into blackness," explains Roger Deakins. "I always thought that was more menacing, more threatening."

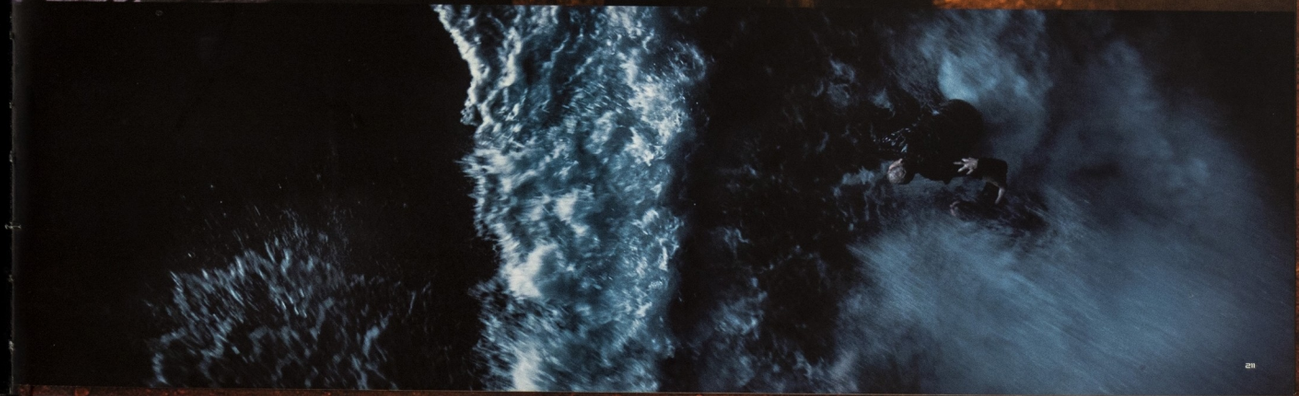
Filming in a tank surrounded by machinery was a technical challenge for the whole crew, recalls 1st AD Don Sparks. "There are so many variables that go into working in water; the complexity of the sequence and the safety issues involved. And since it's the climax of the movie, you can't leave the sequence short, because it's one of the last things the audience will see."

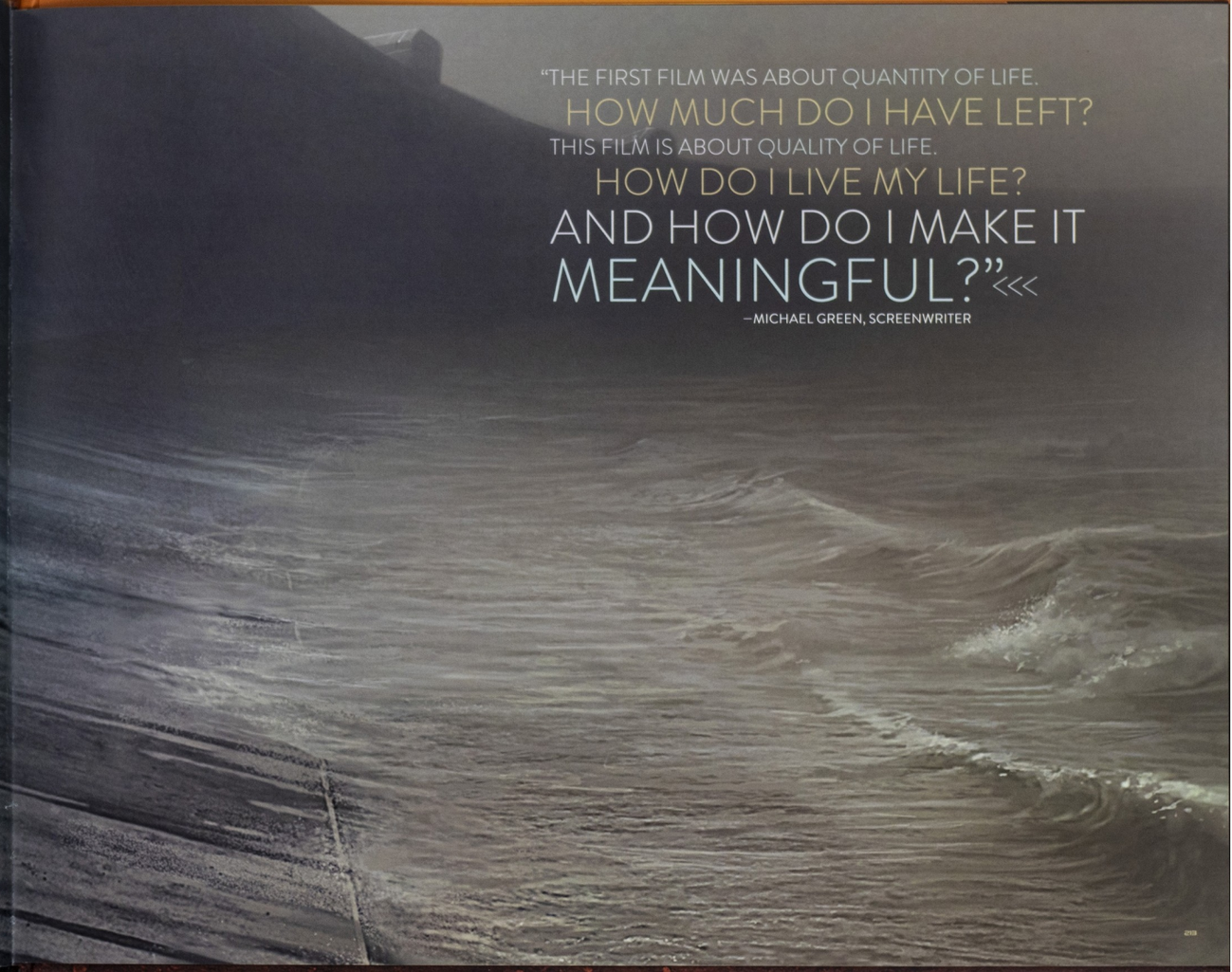
Denis Villeneuve was very concerned about the actors during these night shoots. "We were in harsh conditions and I was reluctant to make Harrison and Ryan go back in the water for another take. But Harrison said, 'It's not that bad, and we want to get it right.'" And so they did.

For these five months of shooting, this film was our version of an Off-World adventure, a golden land of opportunity and intrigue. No words or images can fully translate the experience of making *Blade Runner 2049*, but we hope this book will have brought you closer to the art and soul of this cinematic experience and the many people who brought it to life.

RIGHT: The fight scene here was executed by stunt doubles Adam Hart and Sylvia Fuzessy, getting yanked backwards by a cable. The dump tanks were not released during the stunt work, because the five-ton waves were too heavy and dangerous for the actors. The rain rig, wave machines, and water cannons were more than enough to create a dramatic environment.

LEFT: Sylvia Hoeks trained for six months to prepare for this fight scene. "I loved it, because I actually got stronger. I felt more like a machine, and that helped with the character." She worked alongside Chloë Bruce, recruited by stunt coordinator Joel Kramer. "She's a martial arts world champion who can do inhuman moves. She taught Sylvia the fight that takes place in this maelstrom of water."





"THE FIRST FILM WAS ABOUT QUANTITY OF LIFE.
HOW MUCH DO I HAVE LEFT?
THIS FILM IS ABOUT QUALITY OF LIFE.
HOW DO I LIVE MY LIFE?
AND HOW DO I MAKE IT
MEANINGFUL?"

—MICHAEL GREEN, SCREENWRITER

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